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WORK OF THE CAVALRY IN PROTECTING THE YELLOWSTONE NATIONAL PARK.

By Captain GEORGE S. ANDERSON, Sixth Cavalry.

BEFORE entering upon the subject proper, it will be well to give a short résumé of the history of the Park, and to show by what process the cavalry becomes a part of the legal machinery for enforcement of order there.

The organic act of the Park bears date March 1, 1872. The first superintendent was appointed on May 10th of that same year. He received no compensation, did not live in or near the Park, and afforded it little or no protection. On April 18, 1877, he was relieved by a successor, who served under the same conditions until July 5, 1878, after which date he received a salary of $1,500 a year, and spent at least a portion of each year within the Park.

This superintendent was removed February 2, 1882. He paid little or no attention to the protection of the game, and was himself one of the leading vandals in breaking up and carrying away the beautiful incrustations about the springs and geysers, and in despoiling the petrified forests. In succession to him were three others, whose joint incumbency covered the period from February 2,

1882, to August 1, 1886. During all this time there was no law for the government of the Park, and all acts of the superintendent were arbitrary and legally unauthorized.

In March, 1883, the Sundry Civil Bill provided that the Secretary of War be "*directed*," on the request of the Secretary of the Interior, to make details of troops to prevent the destruction of game and objects of interest. Congress, however, failed to properly provide for the execution of this act, and the Interior Department did not seem to desire the assistance of troops; so no action was taken under it for several years. Meanwhile the destruction of the Park was going on at an accelerated rate, until in 1884 the Legislature of Wyoming, then a Territory, passed a law for its protection. The law was strict enough, and its penalties were ample, but the machinery for its enforcement was most defective.

The assistant superintendents of the Park (Federal officials) were given appointments as justices and constables under this law, and eked out their small salaries by levying a species of blackmail on the traveling public. Finally the law was repealed in March, 1886, and the Park reverted to previous conditions. The repeal was brought about in this way: In 1885 a Member of Congress from Illinois was arrested and fined $50.00 for leaving his camp-fire unextinguished. To the justice of the peace he looked about like a man who would probably have $50.00 in his pockets. Had he paid it, the money would have been divided between the justice and the constable, and all would have been well; but this time they had the wrong man. Under the law an appeal lay to the Wyoming courts. This Member of Congress made a motion for an appeal, and asked them to fix the bond. Such proceedings had never been heard of in their court, and an adjournment was taken for consultation — and drinks.

The justice had never heard of an "appeal bond," but he was resourceful. Could he not put the amount out of reach; make it $100,000, and still get the $50.00 in cash? That was his method; but it did not work. The prisoner offered as bonds Mr. G. M. PULLMAN, Mr. STORY and Mr. ARMOUR, and other friends who were with him, who offered to qualify for several millions.

The guardians of the Park had evidently hit too deep; they took another adjournment — the justice and the constable — and returned with a verdict of "not guilty;" but this the prisoner would not agree to accept. This begat more trouble. The results of it all was that from the Sundry Civil Bill for 1886 the pay for the superintendent and his ten assistants was struck out and, strange to say,

they all vacated their offices at the end of that year. It was then that the act of March 3, 1883, came in play, and in accordance with its provisions the Interior Department asked for the army.

Major MOSES HARRIS, then captain First Cavalry, was sent with his troop from Fort Ellis, Mont., and became the first military ruler of the Park, with the title of "acting superintendent," while at the same time he was the military commander of the troops, under army regulations. He arrived and assumed charge in August, 1886, and the Park has been under military rule, and cavalry rule, ever since that date.

SNOWSHOE PARTY.

Until June, 1894, there was no law to protect officers and troops in the exercise of their onerous duties under park regulations, but for the last three years all has been properly provided for by the "Yellowstone Park Protective Act" of May 7, 1894.

The military garrison at first consisted of a single troop of cavalry, which remained here the entire year, assisted by a second one (or a detachment) from June 1st to October 1st; this second one always summered in camp at the geyser basins.

In 1891, upon my arrival here, the construction of a new post was begun. This post was intended to replace the old, temporary one, built by Major HARRIS in 1886. The new post was occupied in November, 1891, and in May, 1892, a second troop arrived here and

has remained ever since, spending the summers in camp and the winters in the old post.

The Park proper is about fifty-four miles from north to south and about sixty-two miles from east to west, giving an area of about 3,350 square miles. In 1891 the President declared a forest reserve, in shape like an L, on the east and south of the Park—about twenty-five miles on the east and ten miles on the south. This area was placed under the control of the superintendent of the Park, "with the same rules and regulations as were in force in the Park itself," but of course it was not under Park *law*. This added about 2,000 square miles to the area to be guarded, making the entire domain longer than the State of Connecticut. This tract is situated on the very summit of the Rocky Mountains. Fort Yellowstone, which is nearly the lowest point within it, is about 6,300 feet altitude. The most of the Park plateau is near 1,500 feet higher, and the peaks rise to 11,000 to 13,000 feet. The whole area is well watered, which results in a heavy snow-fall. There are large sections near the Yellowstone Lake, over which the year's snow-fall is fully twenty feet. At least four-fifths of the Park is covered with a dense growth of highly resinous pine trees, too small for lumber, but perfectly adapted to conserve the snow and allow it to gradually melt and pursue its belated course to the ocean.

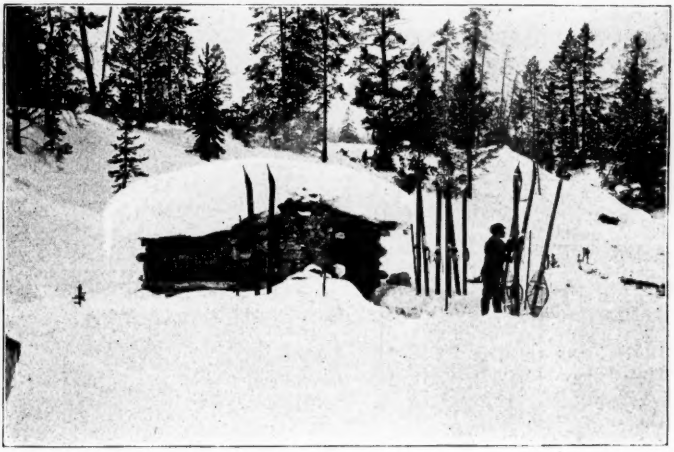
There are few treeless tracts, but wherever such are found the grass is luxuriant, and there the game seeks its winter sustenance.

As might be supposed, the climate is very severe, yet in many ways it is enjoyable. Thermometer records have been kept since Major HARRIS came in 1886, and a hasty inspection of them shows that here, at Fort Yellowstone, the thermometer has been as low as zero every month in the year but May, June, July and August, and that it has been below freezing every month in the year. In the higher levels, which include most of the Park area, we expect at least ten degrees lower. At the time of this writing the registered thermometer at this post has not been above zero for over five days, and one day showed a record of twenty-nine degrees below. In spite of all this, we enjoy delightful weather most of the time, for we are spared the winds which make low temperature unbearable.

The works of "protection" which have fallen to the cavalry may be generally grouped under three heads. 1st. Protection of the beauties and wonders of the Park from destruction by tourists and sight seers; this work is confined almost entirely to the four months of travel—June, July, August and September—while hotels are open and transportation service running. 2d. Protection of the

forests from fires; this work is largely limited to the camping season, which is, generally speaking, July, August and part of September. 3d. Protection of the game from the ravages of poachers.

In addition to the post proper a number of out-stations are established. Four of these stations remain the same summer and winter. One is at Norris Geyser Basin, twenty miles south of here; a second is at Riverside, about twenty-five miles southwest of Norris and near the west line of the Park; a third is on Snake River, one hundred miles south of here and near the south boundary, and the fourth is



SNOWSHOE CABIN.

at Soda Butte, forty miles east of here and near the northeast corner of the Park. Norris is on the main circuit of tourist travel; the other three are on the only routes by which it is possible to enter the Park by wagon.

A non-commissioned officer and three men are kept at each place during the entire year. They have good, comfortable log houses, with fairly comfortable stables. The horses are left at all of them, except Snake River, during the winter, but on account of deep snow they cannot, as a rule, be used between December 1st and May 1st. The Snake River horses are turned into post in November and sent down as soon as practicable in the spring. We have generally found it impossible to get to this station with supplies before July 1st.

The main work of these men is to examine all parties entering

and leaving the Park, register their names, destination, transportation, arms, etc. If entering with guns, the mechanism is so tied with red tape as not to be capable of movement, and the knot in the tape filled with red sealing wax. Each party is then passed on to the next station that it will meet on its way.

All violations of Park regulations are looked after, and particular attention is given to the prevention of forest fires. For this purpose a mounted man leaves each station every day during the season, soon after his breakfast. He rides leisurely along the road, carefully examining all recently abandoned camps. Should unextinguished

CROSSING ALUM CREEK.

fires be found, the guilty parties are arrested and brought here for trial. At a point about half way to the next station a man from that post is met; the two eat luncheon and spend an hour or two together, and in the afternoon they retrace their steps, exercising the same vigilance as in the forenoon.

But it is in winter that their hardest and most perilous work comes. All must be done on snowshoes, and the Norwegian ski is the one always used. The work at this time is entirely under the third head—the protection of game. As blankets, subsistence, and all necessaries must be carried on the back, I have established a number of small huts, with fireplaces, at different places known to the men on station, and in the autumn these are stocked with cut

wood and certain staple articles of food, such as flour, hard bread, bacon, coffee, sugar, etc., properly protected in tin-lined boxes. There are few trips now made where the men cannot spend the night in one of these.

For bedding a man generally carries a fur-lined sleeping bag, and in case they have to spend the night out of doors, one must sleep while the other keeps up the fire. It is always necessary to carry an axe, and I never permit a man to go alone on any snow-shoe trip.

I require monthly reports from these stations, giving names of men on trips, date of departure and return, number of miles traveled—on horseback and on skis—object of the trip and results accomplished. The mileage reported from these stations runs from 200 to 500 per month on skis, and more when they go on horseback.

In addition to these stations, I have a winter station at the site of the summer camp of the troop, at the Lower Geyser Basin, and a winter station near the Hayden Valley, and summer stations at the Upper Geyser Basin, Cañon, Lake and Thumb. The main object of these summer stations is to regulate the tourist travel, keep it orderly, prevent forest fires, and prevent the mutilation of everything beautiful by scribbling names upon it. The deposits of the hot springs soon cover a name, written in pencil, so it can not be rubbed off, but the material is so transparent that the name is visible through it for a number of years.

In 1891 there were so many names that I found it impossible to recognize a new one and thus arrest the offender, but I caused them all to be chiseled out, and on the appearance of a name it was sure to be new and the culprit was easily caught by reference to the hotel's and campers' registers, and by use of the telegraph line, which connects all the hotels in the Park.

A very picturesque figure is a sentimental youth at twilight as he transmits his name to fame by writing it upon the "formations" —the hot springs deposits. A much more interesting figure is this same youth at sunrise the next morning, when, followed by a mounted soldier he proceeds, scrub-brush and soap in hand, to the same spot and removes the perishable evidence of his late presence. Each year a good many trials and convictions are had under the law of 1894 for this act as well as for leaving camp fires unextinguished and for breaking or mutilating objects of interest or wonder.

Owing to the rigors of the climate, the winter work is ever accompanied by danger. In March, 1894, a private of "D" Troop, Sixth

Cavalry, left Riverside for the Lower Basin, for the mail. The sergeant in charge of the station went about six or eight miles on the road with him, and he was then over the half of his journey. He was never seen or heard of after, until his remains were found a year and a half later, ten miles or more from where he was last seen, entirely out of his proper direction and in a place where he must have forded at least one large stream to reach. He either became lost and wandered about until he perished from cold, or he met with some of our good neighbors, the poachers, and they gave him his quietus. The latter theory is not at all unlikely. One or two other men have perished of cold since my arrival here, and at present there is a man in hospital whose feet were badly frozen on a recent snowshoe trip to the buffalo country.

During the ten years of occupancy of this post, only six deaths have occurred among the soldiers here, and five of these were from violence. The records show this to be the most healthy post in the army, in spite of the very large percentage of frost cases. For the most part the men are thoroughly satisfied on stations, and it is never difficult to get men to volunteer for these places. The main trouble is to get non-commissioned officers suitable for the duties. It requires much tact, judgment and firmness in dealing with tourists; and it requires energy, push, courage and knowledge of the country, and the ways and habits of poachers in dealing with their winter problems. They have as a rule been faithful to their duties, honest, reliable and worthy of all praise.

As a consequence of their good work, the beauties of the Park are no longer defaced; no fires have ravaged the forests; poaching has diminished to a small percentage of what it was ten years ago; and more than all, order exists everywhere, and there are no more fake courts in session for the blackmailing of innocent travelers.

The government truly recovers a large interest on this small investment.

HORSESHOEING.

By Captain WILLIAM A. THOMPSON, Fourth Cavalry.

THE fact that a very large majority of horses have imperfect feet, contracted and mutilated walls of the hoof, is *prima facie* evidence that we have not, as yet, in general use, a system of shoeing, and a horseshoe that is perfect. Out of a thousand prairie and ranch bred horses that have never been shod, it is exceptional to find any afflicted with any of the diseases so common to horses that have been subjected to constant shoeing, such as spavin, ringbone and diseases of the fetlock joint, coffin bone, and hoof.

A horse with good, sound feet, properly shod, so the hoof is kept in a healthy and natural condition as far as possible, should be serviceable for twenty years. The average period of a horse's usefulness is not over twelve years. I believe it can be proven by the natural laws that govern the breeding of animals, that, owing to this faulty system of shoeing horses that has been going on for ages, the hoofs of our stallions and mares have become so deformed that their get are born with badly shaped and imperfect feet.

The horseshoer, with a very few exceptions, in preparing the hoof for the shoe, proceeds to slice off the wall, sole and frog, to the extreme. As a rule, so much of the sole is sliced off that it is left so thin it can very easily be dented by a slight pressure of the finger. Of all parts of the hoof, the frog and sole, as well as the outside ball of the hoof, are the parts that under no circumstances should be cut off or in any way removed. It is a very common custom among our horseshoers to fit the hoof to the shoe, instead of fitting the shoe to the hoof. After the shoe has been placed and nailed, in many instances from a sixteenth to as much as three-sixteenths of the wall of the hoof projects beyond the outer edge of the shoe, especially at the toe; they then rasp off this portion of the

outside wall of the hoof, simply so they can have a neat looking job. The result is, it is only a short time before the hoof is ruined.

This nonsensical and pernicious habit, coupled with the cruel cutting away of the sole and frog, has been the cause of completely ruining thousands of horses, and also the cause of untold agony and suffering. Every nail driven into the wall of the hoof, and every unnecessary portion of the wall sliced or rasped off, is a mutilation, and any part of the sole and frog removed is a great injury, for it is totally unnecessary, and only hastens the permanent disablement of the horse.

The knife should be discarded. The rasp is the only tool needed in preparing the wall of the hoof so the shoe can be placed. By using the knife, uneven cuts of the surface are made, and it is a very common practice for the horseshoer to place the shoe, just hot enough (and very frequently red hot) to burn the wall in order to make the shoe fit, or rather to burn the surface of the wall level, all of which is most injurious. When the rasp only is used, a level-bearing surface for the shoe to rest upon the wall is secured.

After having my notes ready for this article—ones that I had jotted down from time to time during my twenty-five years' frontier cavalry service—upon this matter of horseshoeing, I read an acknowledged English authority upon "horseshoeing," and he recommends the burning of the wall with the shoe, to be placed so as to secure this level-bearing surface so much desired. As noted, by using the rasp only the same result is secured, therefore why the necessity of burning? I think it is a great injury, and only hastens the deterioration of the hoof, for the following reasons:

The wall consists of a number of fibres containing a soft, cellular, nutritive material. If this is burned, it destroys the moisture of the horn which is so essential to its life and toughness, and in consequence the horn becomes brittle and hard, then contracts. Having become hard and contracted, the wall presses unduly on the vascular and sensitive parts within, especially on the lamina, and this becomes inflamed and ultimately diseased. A good horseshoer can fit the shoe to the wall as it should be done without applying it red hot. To my mind this method is unnatural, and if followed constantly, will ruin the wall of the hoof in a very short time. If the shoe is constructed with a perfectly level surface, about one-half inch in width, for the wall to rest upon, that solidity and perfectly even bearing surface can be secured by the use of the rasp alone.

It is a difficult thing for the shoer to use the rasp, as now made and shaped, so that he can take the wall of the hoof only, because

its width is such that he is forced to—and does—rasp off a quantity of the sole, almost the same thickness of it, as of the wall of the hoof. The wall of the hoof, that portion where the shoe is placed, is a full half inch in thickness at the toe, tapering towards the frog or heel to less. It is desired to rasp off the wall only, and not touch any part of the sole. To enable the shoe to do this, take the fourteen-inch rasp, place a piece of iron a quarter of an inch thick, half an inch wide, and as long as the rasp, clasped at each end so it divides the rasp's cutting surface, as in Fig. 1. The rasp so fixed enables the user to cut only to the proper depth. This rim rests against the outside wall of the hoof, and the rasp can cut only the wearing surface of the wall.

Fig. 1. Cutting surface 14" rasp divided.

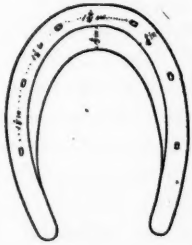


Fig. 2. 5 or 6 nails.

After using the rasp.

Before using the rasp.

The defects of the horseshoes now in common use are:

1. They are very heavy, weighing sixty-four ounces to the set, front and hind. Being made of wrought iron and soft steel, they are necessarily thick.

2. Swelled at the heel. I never could understand why horseshoes are all made so the heel of the shoe is so much thicker—at least one-eighth to three-sixteenths of an inch—than at the toe; but there are a number of good reasons why they should not be so made. A horse standing on a level without shoes rests equally upon all portions of the hoof. The frog then acts as a cushion, and when he steps off receives the shock and prevents slipping; with the raised heels, coupled with the thickness of the shoe as noted, the frog cannot strike the ground, and the result is, in time the frog becomes hard and dried, and to help this evil along the shoer slices it off. This elevated heel of the shoe gives an unnatural slant to the hoof and the longer the shoe is worn the greater is the slope; the shoe is always worn thin at the toe and very little at the heel. This unnatural and forced position of the horse's feet, I am quite sure, causes sprains and inflammation of some one of the joints, bones, ligaments or tendons in the horse's legs from the knee to the hoof that ultimately lead to such diseases as bone spavin, ring bone, and other painful diseases the horse is heir to in that part of his anatomy. From the knee to the hoof is the most wonderful and delicately constructed portion of the horse, and if we cause the slightest interference with the proper adjustment or working of any one of the joints, tendons or ligaments, an inflammation is produced, ulceration and suppuration follow, and the result is a ruined horse.

3. The shoes are all made with a groove in which the nail-holes are placed. This groove soon wears off and the nail-heads with it; also the shoes have eight nail-holes, four on a side, and placed so close together that the wall of the hoof is in many cases split, chipped off or otherwise injured.

We must shoe our horses, and the endeavor should be to arrive at some method of doing it with the least possible mutilation or injury to the hoof, save the horse pain and discomfort, and allow a perfect working as nature intended of all the parts of the leg and hoof. The following system of horseshoeing I used in my troop for the last two years with excellent and very satisfactory results:

To prepare the hoof for the shoe, use the rasp divided as described. The shoer can cut only the wall, rasp off just enough of it so that when the shoe is placed it will fit the wall, the outside

rim of the shoe to be even and flush with the outside edge of the wall all the way around. The shoer must be guided by the shape and condition of the bottom of the hoof as to the amount to be rasped off. In designing the horseshoe the endeavor was to have it as light in weight as was consistent with the character of the work the horse was called upon to do, for every ounce that can be saved the horse from carrying in the shoe takes just so much from his fatigue after every march, and lessens just so much the drain on his vitality. It was made of what is known in the market as machine steel. By using this material a shoe of great tensile strength, and weight less than one-half of that of the wrought iron shoe was secured. The actual cost per pound of this kind of steel is but a cent or two more than wrought iron and, considering its many advantages over wrought iron and soft steel, this is far the cheapest of the three.

Specifications.—Fig. 2. Width one inch at the point of the toe, tapering to about five-eighths of an inch at the heel, three-sixteenths of an inch thick from toe to heel, of uniform thickness along the outer rim, inner one-half inch wide where the bevelling commences, this bevelling stopping about one inch and a half before reaching the heel of the shoe.

This shaped shoe gives a level bearing surface of just the width necessary for the wall of the hoof to rest upon. This thickness is ample to protect the wall, and if rasped off properly, leaves the frog so it is able to perform the duties nature intended, and the hoof rests on the ground just the same as it would if not shod.

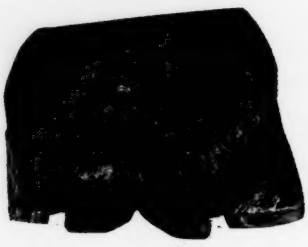
In Fig. 2 six nails were used, three on a side, the two side nail-holes about one and a half inches apart. This distance for the two side nails may be decreased or increased a little, according to the size of the shoe. The nail-holes countersunk just so deep that when the nails are driven home about one-sixteenth of the nail-head projects. By having the nail-holes countersunk it strengthened the shoe, by doing away with the groove; the slight projection of the nail-heads assists in preventing the horse from slipping, and the longer the shoe is worn the firmer the nail-heads are set. The particular distance apart of the nail-holes in any shoe is of great importance, and no person who has not studied and experimented upon the subject can fully realize that importance. (1) Being so far apart, it reduces the danger of splitting or chipping off the wall of the hoof to a minimum. (2) It saves mutilating the hoof two nails. (3) It holds the shoe in place more firmly and much better than using four nails on a side so close together.

I kept four of the troop horses shod with these steel shoes, with the following results, viz: (1) All the sets used were worn evenly from toe to heel; of course a little more immediately at the toe, than any other part of the shoe, but very little in comparison with

Shoe fitted

The old wrought iron shoe. no frog pressure.

Old wrought iron shoe. Hoof cracked from using eight nails.



Steel shoe showing frog pressure.

the wear of the raised heel shoes at the toe. (2) This fact proves that the principle is the correct one, for the horse uses and wears off the shoe evenly from toe to heel, just as the wall would wear off if not shod. (3) These three-sixteenths thick steel shoes protect the wall only, permit a perfect freedom of action on the part

of the frog, enabling the horse to stand without the slightest strain to the hoof or any part of the leg. I used these shoes for eighteen months, and proved that at the very greatest requirements of hard campaigning three sets of front shoes and two sets of hind will wear a horse for one year.

Horses' hoofs differ as to growth; some grow faster than others; all more rapidly in summer than in winter. Resetting these shoes once a month is a safe rule to follow. When the outside edge of the wall commences to project a little the shoe should be reset. These shoes were used upon one or two horses that had badly contracted feet, with a decided improvement.

The cavalry that can be equipped for war with the very least possible weight in all articles necessary for both horse and rider, will last longer and be of much more value than a body of cavalry where this important object is not carried out to the utmost limit; and the correct way to start in is to commence with the foundation of the horse. If we can have our horses shod with shoes that weigh just half as much as the kind now used the horse will carry two pounds less on his feet, and two pounds less on his back (every cavalryman is supposed to carry a set of shoes in his saddle-bags), so we save the horse from carrying four pounds, and in addition have horseshoes that wear just four times as long. The wrought iron horseshoes weigh four pounds, and a horse will wear out a set in one month. These machine steel horseshoes weigh two pounds per set, and a set will last four months.

THE SHELTER TENT.

By Captain JACOB A. AUGUR, Fifth Cavalry.

A BOARD of officers convened at Fort Leavenworth, Kansas, August 5, 1889, in obedience to Special Orders No. 90, headquarters Department of the Missouri, July 27, 1889, and continued in session until it made its final report May 2, 1891, on the subject of shelter tents and knapsacks. Lieutenant J. F. Bell submitted a shelter tent as an improvement on the tent then in use, which latter consisted of two halves, the two halves buttoned together, making the tent open at both ends. The material was of very poor quality, affording but little of the shelter which its name implied, was not waterproof to any extent, in that it was soon soaked through, leaked, and practically of very little use as a covering except to lessen the downpour if it came straight down, otherwise, if the rain was a driving or slanting rain, one might as well be under no covering at all.

Campaign after campaign has been made with this article called a shelter tent, a misnomer, and officers and men subjected to the elements. This state of things has occurred so often it is a marvel that no one has attempted to improve upon this equipment long before, by suggesting a new article heavy enough to keep out rain, and improved by minor details, so the service could have a shelter tent in name, which fulfilled the functions of a covering shelter, comfortable, roomy, dry, and not too heavy to prevent its being added to the equipment of the soldier, especially with reference to the infantry.

No doubt the existence of the above state of affairs impressed Lieutenant Bell, and his admirable shelter covering was the outcome. He did not claim it especially, as I understand it, as an invention, but simply as a design, which he submitted as a better and more suitable one than the tent in existence at the time that he

appeared before the Board. Since that period, six or more years ago, the Quartermaster's Department has still issued the old pattern tent until very recently, when a new kind replaced this one, so that when pitched the tent could be closed at one end. The fabric from which it is made is no better than of old. It is just as flimsy and worthless, and marks no great improvement as a shelter. The word shelter signifies that which covers, a protector. The name should not be given to a design which does not literally fulfill the spirit as well as the meaning of the name. Consequently I fail to comprehend the reason for continuing the issue of an article that is neither "fish, flesh, or fowl." The only excuse I can discover, which is a very poor one, is that "it is not deemed advisable." I confess this is the only reason, and am very sorry to have to advance it in this age of enlightenment, progress and civilization.

This tent was examined by the Board, a report duly made, with the recommendation that fifty of these tents be made and issued to one troop of cavalry and fifty to one company of infantry. The Board, in speaking of this tent, said: "The shelter tent submitted by Lieutenant BELL is superior to anything else of the kind ever seen by the Board, and meets with their complete approval."

Forty seven of the tents were sent to my troop, "A," Fifth Cavalry, for trial and report, in the spring of 1893, just previous to a change of station from the Indian Territory to Texas. It was not until the fall of 1894 that I was enabled to make my report, which was most favorable to this pattern, and I expressed the hope that as this tent fulfilled all the requirements of a good shelter, and so far superior to the old pattern, they would be manufactured and issued to the service. Since that time a further use and test has more than confirmed my expressed convictions.

While stationed at Fort Sam Houston, Texas, several officers were sent out with small parties on bicycle reconnaissances. To each officer I gave one of these tents; upon their return they all expressed but the one opinion, that it was the best tent they had ever seen. Again, on a practice march in the spring of 1895, from the same post, with four troops of cavalry, my troop used the Bell tent, the other three troops those issued by the Quartermaster's Department. One night after camp was made a violent and heavy rain, with a strong wind, came up, lasting nearly the whole night. My tents were pitched as tents and ditched, and the men were completely protected and dry, while the other men were wet and uncomfortable the whole night. This was a practical test of the two tents,

and settled, without any doubt whatever, the superior advantage of the Bell tent.

Nothing further seems to have been done in the premises, and we still are receiving the pattern now in use. As to the actual weight, this is an important factor to be considered. The weight of the half piece of Lieutenant BELL's pattern is three pounds nine and one-half ounces; the weight of the half now in use is two pounds seven ounces. The difference in weight is one pound two and one-half ounces. The designer uses the carbines and rifles for tent poles, and thus does away with the necessity for carrying poles. Even if it is not deemed advisable to use the gun or carbine for poles, the men could be in no worse a plight than at present. For the cavalry there is no objection to this slight increase in weight, when the comfort that follows these few extra ounces additional is considered. The roll on the cantle of the saddle will have to be more carefully and tightly rolled; this is the only difference. The stud on top of the tent was made for the .45 caliber. In those that may be made hereafter the stud would be made for the .30 caliber. If a suitable pole is desired, I would suggest a telescopic steel pole, light, yet strong, so when closed it would be just one-half the length of the pole. It could be rolled in the blanket, each man having one pole. These two men would have a complete tent.

For cavalry the arrangement would be perfect; now for the infantry. Let us see what weight the soldier is supposed to carry:

One blanket	5 lbs.
One blue shirt	1 lb.
One knit undershirt	13½ ozs.
Two pairs of drawers and two pairs of stockings	1 lb. 13 ozs.
Small articles	½ lb.
One overcoat	6 lbs.
One pair shoes	5 lbs. 3 ozs.
One gun	9 lbs. 5½ ozs.
One bayonet	1 lb. 8 ozs.
One hundred rounds amunition	7 lbs. 6 ozs.
One-half shelter tent	3 lbs. 9½ ozs.
Belt	1 lb. 4 ozs.
Total	43 lbs. 3½ ozs.

Whether in actual campaign service, more especially in a warm climate, or during a summer campaign in a northern climate, the soldier will, even if he starts out with a full kit, have much left but the actual absolute necessities at the end, will be an experiment that must be tested again in actual warfare, although during the

late war, 1861 to 1865, the loaded knapsack was cast aside and replaced by the blanket roll.

Whether this practice was confined to our volunteer forces only it is impossible to determine, for our regular army was a mere handful in comparison, yet it would be important to know whether there was any difference between them in carrying the kit. Our forces, in the event of a war, will be composed entirely of volunteers, except the small regular force of 25,000 men, and it is an open question whether the men could be made to carry a heavily loaded knapsack with the articles deemed essential. Knapsacks have been cast aside, and it is fair to presume they will receive similar treatment in future armed conflicts. However this may turn out, if it is advisable to load a man, a shelter half, with or without poles, should form part of his outfit, and it must be a serviceable one, just heavy enough to form with its mate a covering that is in reality a covering and shelter in its truest sense. If the load is a trifle heavier this objection is offset by the comfort afforded the man when, after a hard day's march or in camp, when exposed to the elements, he knows that at night he will have a sure refuge, a place in which he can repose and rest in peace, with no disturbing causes to keep him shifting to keep dry. This, to my mind, is ample compensation for all other drawbacks. This applies to the foot soldier. For the cavalry, no such objection can, with propriety, be advanced.

The issue of this tent has apparently been limited to the two issues recommended by the Board. Very few, comparatively, in the service have seen the tent, and more than half of the army have not even heard of its existence, and perhaps are hoping for a new model shelter tent in place of the apology for one we now have, when in fact there is such an admirable one, *en evidence.* It is not understood why the general issue is not made. The tents were made by the Ordnance Department at the Rock Island Arsenal, but as the designer has the working patterns, the Quartermaster's Department could just as well manufacture them, by following the plans. Troops in every war must bivouac with all its accompanying discomforts. It is part and parcel of a soldier's lot to be subject to all the ills that war entails. In its worst features, war can be toned down to a minimum if the men can procure temporary shelter. There is none so good, so easily obtained, because each man carries it, as a good shelter tent. I do not believe, judging from my own feelings, that men in dire distress would cast away

an article which offers a shelter and refuge from storm and cold. I may be wrong; if so, then I am happy to be on the wrong side of the question.

In the campaign of 1876 against the Sioux Indians, after the long march north, when the command of General CROOK turned to the south, towards home, hundreds of miles away, there was little of anything left to carry on horse or man. Violent and heavy rains were added to their other discomforts of lack of food, clothes, and blankets. One day, after the command had gone into camp, a heavy rain storm came on, when suddenly there appeared one shelter tent, standing solitary and alone in all its glory, to the great surprise and astonishment of everyone. Many exclamations as, "Where in the devil did that thing come from?" and other stronger and more emphatic remarks were heard. The few weary souls who could crawl beneath its inadequate shelter found some comfort which all the others would have been glad to have secured. If one could look out for himself, why not others? Men are not alike; some will suffer, when by timely forethought their sufferings could have been mitigated. So I say shelter is necessary and can be had, and armies could have it in bivouac and on other occasions, if the shelter was accessible, and ready at hand to be utilized.

Coming back to the main point in the discussion, shelter, I say it is absolutely necessary if it is desired to keep a command in good health and spirits. There is nothing more demoralizing to a force in its morale and fighting qualities than lack of protection from as many of the hardships of war as can be had without coddling the men. Anything which keeps up the spirits, animates the body and soul of a unit, tends to increase its qualities for actual service, and makes an army indeed in the highest and broadest sense, one of discipline and morale, ready for battle, with an abiding confidence in its success.

I have said a good deal, probably too much, on a small subject, a shelter tent; yet I have done so, simply stating what we need and why we need it, in the hope that some good will be the outcome, and the army provided with these serviceable tents. The drawings will give an idea of the tent. Figure 1 shows an end view. Figure 2 shows one of the pieces (a half of the tent), one flap buttoned, the other flap open. The tent may be pitched with one end closed, the other end flaps drawn to the front and pegged, thus making the tent longer. The tent is six and a half feet long, twenty inches high and four feet wide. The sides are made of eight ounce canvas, the flaps of six and one-half ounce canvas. The tents are of brown canvas,

Fig. 1.

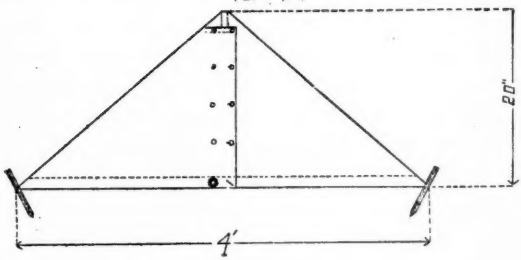
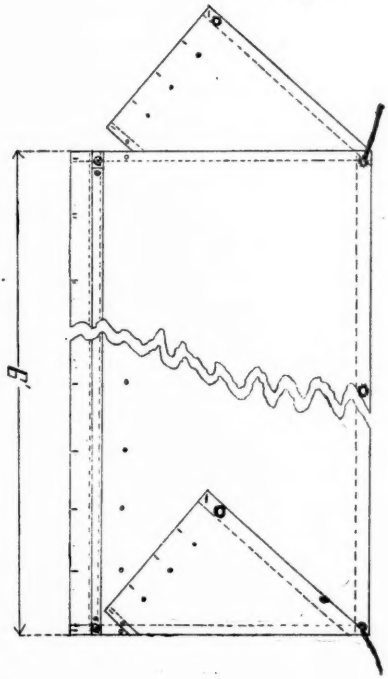


Fig. 2.



the color of the barrack bag, an admirable color, and difficult to distinguish. A camp of this colored canvas would be a hard matter to discover by parties sent out on patrol duty, owing to its bearing a close resemblance to the surrounding ground. If my words on this subject will benefit us to the extent of causing the issue of this tent to the army, I shall feel amply repaid for my feeble effort in bringing this shelter tent to the front. I shall insist that the brown canvas be used in preference to the white, a change that could be adopted with advantage to all other tentage in the service.

CAMPAIGNING IN ARIZONA AND NEW MEXICO, 1895–6.

THE surface of Arizona and New Mexico consists generally of sandy plains, valleys and rugged mountains, that alternate in tiresome succession, scorched during the dry season into desolate waste, devoid of moisture and of anything growing but the hardiest vegetation.

The renegade Apaches, who number only six males, live, as a rule, on the highest peaks, and never descend except in rapid raids for murder and plunder. Their only business is to sack remote ranches, ambush unwary travelers, abduct or kill helpless squaws, and steal or destroy horses and cattle. All grant without question the impossibility of getting at them unless by surprise, and to take them unawares is almost unknown. From their hiding places in the mountains of Old Mexico they make swift incursions into our country and rush back like beasts of prey.

The white man is seldom given any opportunity of defense, and without a suspicion of danger often falls powder-burned. The Apache crosses the valleys only at night and speedily regains the friendly mountains, going at the utmost pace of the horse, that is stolen or changed to suit his convenience. His marvelous ability to travel afoot is derived by long inheritance and steady practice. However steep, craggy or zigzag the path, he glides noiselessly on, and with snaky nimbleness does the severest journeys with incredible ease. Even where there is no real or instant need, he goes half bent, his body above the hips almost horizontal. He is wanton in havoc. Needing a few pounds of meat, MASSAI slaughtered a well-bred stallion valued at three hundred dollars, though he might just as easily have taken a pony or steer worth ten dollars.

The leaders of the renegades are KID and MASSAI, who, since the exit of COCHISE, VICTORIO and GERONIMO, continue in a small, but brutal way, the bloody scenes of other times. The former, the KID, is of the San Carlos tribe of Apaches, and since 1889 has been an

outlaw, with a price of $5,000 on his head. The latter, MASSAI, is a Chiricahua Apache. When his people were sent east ten years ago, he escaped through the car window near Independence, Mo., and wandering back was first seen after three years near San Carlos. His sudden appearance was characteristic. Two squaws, mother and daughter, were gathering hay in the hills, when MASSAI rose out of the earth, as it were, killed the older and took away the younger.

When General MILES, having subdued the Apaches, was about to banish GERONIMO and his Chiricahuas, four escaped, who, with the two leaders, are all that remain hostile to the United States. The feeling of the San Carlos, White Mountain and other tribes of Apaches toward these outlaws, is one of mortal hatred. At San Carlos, the name Chiricahua is synonymous for wickedness, and MASSAI is no better than the devil himself.

Since the Seventh Cavalry came to this department, eighteen months ago, these renegades have murdered and robbed three persons in the Fort Grant district. Mr. H. H. MERRILL, a citizen of Pima, and his daughter, were killed December 3, 1895. The murderers are known to have been a buck and a squaw. It is also clear that the buck shot MERRILL through the heart, while the squaw, going closer, inflicted lingering death by shooting the daughter twice low in the abdomen. The scouts pronounced the buck MASSAI. Mr. ALFRED HAND was murdered on the 28th of March last, with circumstances of peculiar brutality. His ranch, also, was thoroughly sacked. The miscreants are known to have been three bucks and several squaws. The most vigorous but futile effort was made on both occasions to capture the Indians.

On report of HAND'S murder, Lieutenant RICE made 100 miles in twenty-five hours, only to find the game had flown to Mexico. Colonel SUMNER adopted the plan of using small detachments which, operating from a central point, searched the country in all directions, and in the campaign last spring and summer were quite successful.

The arduous service, so full of hardships and privation, thoroughly tested the discipline and tried the strength of the soldiers, who after riding all day were ready to walk all night, and endured without complaint the extremes of heat, thirst and sometimes hunger.

Nothing more can be attempted than a brief sketch of the operations of a single expedition made by either of two detachments

which, under the leadership of Lieutenants SEDGWICK RICE and N. K. AVERILL, of the Seventh Cavalry, were most successful.

The former, after marching seven days, reached in the dusk of the evening a point about six miles from the Indian camp, which from the trail was known to contain one buck and three squaws. As further progress on horseback was made impossible by darkness and the extreme ruggedness of the ground, and would have been unwise, from the likelihood of flushing the game, RICE now dismounted, and dividing his detachment into three parts, proceeded at about 8 P. M. to approach and surround the camp. Though they had marched thirty miles that day and over 200 in the past week, these determined men, setting out on foot, climbed the shaggy, cragged face of the mountain, and reached by daylight their several positions.

Each party was guided by an Apache scout, all of whose catlike qualities were needed to make successful the climb of the soldiers, who in silence and darkness required eight hours to cover six miles. RICE opened fire at break of dawn and the buck was killed. Strong effort was made to catch the squaws, who vanished in a cleft of the mountain, fled to a neighboring cañon and were seen no more. Being fresh and well rested, they easily outran the tired soldiers who had tasted little food since noon the day before. Mr. J. H. SLAUGHTER, a ranchman who accompanied the expedition, leaping upon a horse near by, was close on them, when the animal stumbled, rolled down the mountain, and he, for the time being, was non-combatant.

RICE reports that the camp was on a pinnacle of a high mountain, and was well supplied with goods used by Indians. Everything, including five horses, was taken or destroyed. The buck had a rifle, model of 1873, and a pair of field-glasses. There were several articles of woman's apparel among the spoils, which were taken to Mrs. MERRILL on August 2d and identified as having belonged to her daughter.

The detachments often traveled fourteen or more hours without finding water on the way, and all suffered intensely from heat and thirst. The men's clothing was reduced to shreds, and it was extremely hard to keep horses shod.

After a forced march of some eighty-six miles, Lieutenant AVERILL, Seventh Cavalry, reached another hostile camp, which was known to contain three bucks, seven squaws and a child. It was about 4 A. M. when we struck it, and the detachment had been climbing on foot since midnight. Dividing his small force into

three parties, AVERILL tried as well as possible to surround the enemy and close every avenue of escape, but "as their camp was on a high, rocky hill, at the junction of four deep cañons," this was found impracticable. The black hours had at last crept by, and all were nearly in position, when the savages "suddenly came out together, and running like deer," made a headlong rush for the cañons. The soldiers fired, killed a buck and accidentally wounded a squaw.

AVERILL, in his report, says: "We then climbed up to their camp, and found they had left everything but their guns. They fired fifteen to twenty shots at us from a very high hill six hundred yards away, but did no damage. With a gun of Mr. SLAUGHTER'S and one of the new carbines I soon drove them away. We found a little girl about two years old, a large supply of dried meat, mesquite corn, sugar and salt, bags full of acorns, large hides full of water, nine ponies and horses, seven saddles and bridles, ammunition, smith's tools, reloading outfits for Winchester rifles, blankets, carpets, leather and money. Most of this stuff was American, and four of the horses belonged to SLAUGHTER, whose ranch is on the Mexican line. Much of the property was afterward identified and claimed by Mr. FRANK HAND, whose brother's death has just been noticed.

As far as possible, both RICE and AVERILL traveled by day in cañons and thus concealed their march from the Indians. In both cases surprise was complete, and nothing but insurmountable obstacles could have prevented the victory being a complete one.

Concluding, two of the brigands are dead, and all are deeply thankful in Arizona. They were driven two hundred miles south of the line, when the heavy rains set in and stopped further work.

Detachments under other officers toiled with the same devoted zeal and endurance, but were less fortunate than those whose operations have been sketched.

DEVICE FOR LOADING AND UNLOADING CAVALRY HORSES IN MOVEMENTS BY RAIL.

By Lieutenant N. F. McCLURE, Fifth Cavalry.

THE following is a description of a light, portable, durable, handy and serviceable contrivance for loading mules or cavalry horses onto cars or unloading them from cars. It is a slight modification of the one used in October, 1896, by First Lieutenant E. S. Avis, Eighteenth Infantry, during a movement of troops from Fort Bliss, Texas, in pursuit of alleged Mexican revolutionists. In that instance it was necessary to take on and off horses at several places while en route.

The arrangement consists of eight good oak planks, each 12′x1′x2″, and two trestles. Five planks form the roadway; the sixth is a reserve plank in case one should break, and the remaining two are for sides to the shoot. Each roadway plank should have seven cleats of hard wood, fastened at right angles to the length of the plank on one side, at equal intervals from one another, and from the ends. Each of these cleats should be of hard wood, 1′x3″x1½″, and should be bolted to the planks or put on with long wire nails going clear through, and clinched on the under side. The holes for these bolts or nails should be bored, and there should be four to each cleat. It will be observed that the roadway planks are not fastened to one another. A cast iron shoe to go on the end of each plank on the under side would enable one to hook the end of the board onto the edge of the car, and thus prevent slipping. These shoes should be four inches from the end of the boards, so that the latter would extend well into the car. If a shoe cannot be obtained, then hooks similar to those of a fire ladder, but heavier, should be put on. The Quartermaster's Department could furnish these shoes. The shoes (or hooks) should reach down at least four inches, so that

they could be caught on the door rail of the car. There are several different kinds of these rails, but a hook of four inches would fit all the kinds that I have seen.

On the under side of each roadway plank are fastened four other cleats, two to each trestle. These are put in pairs, just far enough apart to admit of the tops of the trestles slipping between them. These cleats would prevent the trestles from slipping from under the roadway. They should be far enough apart so that the trestle would slip in or out easily. The horse of the trestle should be of 6″x4″ pine, and should be planed off so that the whole top surface would be in contact with the under side of the roadway. The legs nearest the car should make a smaller angle with the ground than the other legs, as this would make the trestle more stable when a horse's weight comes on the shoot. The larger trestle should be three feet high, and the smaller one foot six inches.

The height of the car is taken as four feet. Great care is necessary in placing the trestles properly so that they will take the strain from the roadway. If they are too high the feet can be sunk in the ground slightly. If the ground is muddy and soft, or is sandy, flat stones or pieces of board may be put under the feet of the trestles.

This device can be loaded into a car in five minutes and, if room is scarce, it can be put on top of the car. In two minutes it can be changed from one car to another. During the trip mentioned above, last October, by using it a troop of cavalry horses were unloaded miles from any stock shoot, right out on the ground, in fifteen minutes; and at another place, a stop was made and four horses taken on in about five minutes. It can be used almost anywhere along the road. If there be ditches along both sides of the track, then a road crossing may be selected as the point of debarcation. It would add to the security of the contrivance, if stakes were driven into the ground at the end of each plank of the roadway; but with a shoe as described above, this would not be necessary.

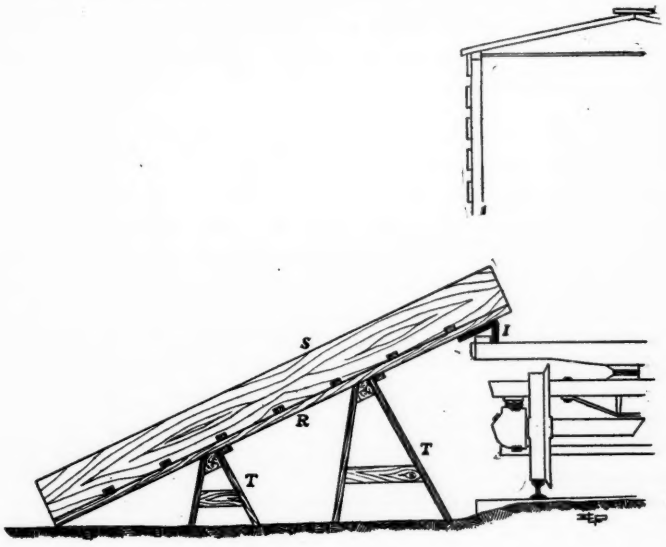
The two side planks may also be provided with cleats so that, in case of loss or breakage of roadway planks, they could be substituted. It is believed that, in case of the loss of the trestles, the two oak planks would still sustain the weight of a horse.

The value of this shoot, particularly in time of war, will readily be seen. It would also be useful where troops, taking horses with them, are changing stations. A troop of cavalry, or a squadron

provided with it would be independent of switch engines and stock-yards. Horses could be unloaded anywhere for feeding, watering, or resting.

A few handfuls of sand thrown on the roadway prevent the horses from slipping much. Lieutenant E. S. Avis, Eighteenth Infantry, intends to perfect this shoot by experiment. The one I describe can be made at any post.

The following is a sketch of the device:



S. Side-board.
R. Roadway Plank.
T. T. Trestles.
I. Iron Shoe.

NOTES ON FEEDING CAVALRY HORSES.

By Lieutenant ALLYN K. CAPRON, Seventh Cavalry.

SO many able articles upon the horse, and subjects pertaining to him, have appeared in the JOURNAL that I hesitate to contribute one upon a question of such importance as that of "feeding cavalry horses," knowing full well that there are many officers far better qualified than I to write such a paper, and who could give it a scientific treatment, to which I shall not aspire.

This article is not by any means entirely original. I doubt if any article upon the horse is original throughout. My remarks are the results obtained from the study of a number of works by the most prominent members of the veterinary profession, and of many experiments made by myself.

To improper feeding can be attributed the majority of digestive disorders met with in cavalry horses. Every mounted officer should, therefore, be posted upon the subject, for in the words of a celebrated general of cavalry, "the strength of the horse depends upon his proper nourishment, and upon that strength depends the proper performance of our duties, and all our hopes of attaining distinction."

In our service, as is well known, the forage furnished for public animals consists principally of hay, oats, corn, barley and bran, the grain component of the ration depending upon the section of the country in which the animals are serving; barley, for instance, being issued in California, and corn in the North. Regarding the classification and nutritive value of these different foods I shall say but little, but will confine myself principally to the manner of feeding.

All public animals in our service are, as a rule, fed but twice a day. An examination of the digestive apparatus of the horse will show that the stomach is, comparatively speaking, very small. It is evident that it should not be so greatly distended with food, that

all power of contracting upon its contents is lost. The time required by the stomach for digestion depends upon the kind of food given, hay, for instance, passing out more quickly than most of the grains. The emptying process takes place soon after the animal begins eating, and continues rapidly so long as he takes his food. After eating, the passage becomes very much slower, and to empty the stomach entirely, three or four hours are required. When we give the horse large "feeds" at long intervals, the animal being hungry after his long fast, ravenously eats or bolts his food, thus very often causing the stomach to become distended and paralyzed, because it has not sufficient time to empty itself. Impaction is the direct result of such methods of feeding, and is almost always fatal. Tympanites of the stomach is also often caused by these large "feeds," while rupture of the stomach, for which no treatment is of any avail, is generally brought on in the same manner.

To the intestines, principally, are left the duty of digestion, and we know that only a certain amount of food is digested, while another portion is undigested. Therefore, if the horse receives too much food at one time, a large amount of digestible material will pass out unacted upon, thus causing an unnecessary expenditure of vital force by the digestive organs. What is the result? Indigestion and flatulent colic. As a matter of fact, nearly eighty per cent of the cases of wind colic are caused by these large feeds at long intervals To prevent such conditions it is only necessary to *feed small quantities of food at short intervals.*

Horses should be fed at least three times a day, and many high authorities say four. All of them agree in saying that at least three meals per day are absolutely necessary for the maintenance of good health.

The English service long ago awoke to the fact that the two meal system was most injurious, and now have "stables" three times a day for the purpose of feeding. In the morning they feed from one to two pounds of grain and one-fifth of the hay allowance, which in England is twelve pounds. At noon the horses are given five pounds of grain and the same amount of hay as at morning stables, while at evening stables, five pounds of grain and the remaining three-fifths of hay are fed. In our service we generally feed a large amount of grain, say from four to six pounds, in the morning, while the evening meal consists of about the same amount of grain and all of the allowance of hay, which is fourteen pounds. The English method is by far the better of the two, and I am sorry

to admit that the American cavalryman, usually so progressive, shows poor judgment in his manner of feeding.

The only reason I can find for our present system of feeding, is, that it is practicable to feed but twice daily while in the field, and that the horses should become accustomed to but two meals before entering upon a campaign, or fatal results would follow. While in campaign, horses have to be fed as occasion offers; often they will be lucky to get one square meal a day. Such being the case, we might just as well feed but once a day while in garrison, as to feed twice. Then again, if we feed but twice a day to prepare our horses for campaign, why not give them the rest of the hard work incident to such service? You answer that by so doing we would soon "break them down." Exactly. But we also "break them down" when we cause them to have indigestion and tympanites, both of which are results of the two meal system.

It most certainly seems to me that a horse free from indigestion and other stomach troubles, could far better endure the hard work and irregular meals of the field than one whose digestive organs have been ruined by disease. If it is possible to give them but one or two meals a day while in the field, they will have to stand it as the men do; but if the horses begin the campaign with their digestive organs in perfect condition, could they not stand it better than if they went into it from the first with all sorts of stomach disorders? I believe any fair minded person, who understood the results of such disorders, would answer "Yes." Then as long as we can give them three meals a day during times of peace, does it not seem but proper for us to do so?

We want our horses to have sound feet before entering upon a campaign, although we know they may have them ruined by the work they may be called upon to perform. We want their respiratory organs in perfect condition, free from disease, before leaving the garrison, although knowing they may all become victims to pneumonia or pleurisy before the campaign is finished. Then why is it not equally desirable that their digestive organs should be in good condition before starting upon the march, even though they may, in the course of the campaign, become ruined?

In the field, horses often have to stand at the picket line during a terrible snow storm, and stand there all night. Is that any reason why they should be made to stand out at all times while in the post, no matter what the weather, or how far down the mercury falls? No. But is there not just as much reason for this as for feeding but twice a day, to accustom horses to the field? I think so.

As mentioned before, hay passes through the stomach more rapidly than most of the grains. It would seem but proper, then, as recommended by MICHENER, that grain be fed *after* hay, "for if reversed, the hay would cause the oats to be sent onward into the intestines before being fully acted upon by the stomach, and, as a result, produce indigestion." Experiments with fifty government mules have convinced me of this, and it seems to me a most important point. Then, again, hay requires more time in mastication, and cannot be bolted like grain. For this reason it is also best fed before the grain, and especially in the case of very hungry horses, or after a long, hard march.

In nearly every troop that I have seen the grain is ready for the horses, together with the hay, when they are led in after evening stables. The animals, being hungry, almost always bolt their corn or oats, after which they eat their hay.

It is hardly necessary to mention that horses should be watered *before* feeding, otherwise the food will be washed from the stomach before it is ready for intestinal digestion. If this cannot be done, then they should not be watered for at least two hours after feeding. In hot weather, to prevent sunstroke, neither food nor water should be given in excess.

Another point regarding feeding, with which all cavalry officers are familiar, but which is of the greatest importance, is feeding the horse according to the work he is to perform. When an animal has a hard march before him he should be given a "spare feed" about two hours before starting, and never a heavy one. No animal can perform hard labor on a full stomach. Take the hunting dog for instance. In the morning before hunting never feed a dog so much that he cannot work. Many a so-called hunter gives his dog a heavy breakfast before starting, and then wonders why he "goes slow" all day. Give him but a "spare" breakfast, and at night after he is thoroughly rested give him a good meal.

I believe it is the same with man. Often I have ridden forty or fifty miles on half a pound of dates and a cup of cocoa, the nutritive properties of which are, by the bye, astonishing, and felt better than when I started out after a heavy breakfast. In the case of the horse, however, it is a most dangerous thing to give a heavy feed before hard work. After the march a small quantity of hay can be fed, but he must be given no grain for at least an hour or two after the camp has been reached. Violations of these rules are almost sure to result in "colic" or tympanites of the stomach, and most probably in death.

When there is but little work to be performed, and on Saturdays and Sundays when in garrison, the horses of the troop should be given less food than on days when hard word is expected of them; in other words, *the quantity of food must depend upon the amount of work to be performed.*

Horses should be turned out to graze at every possible opportunity. Not only is the grass they thus obtain of value as an alterative, but it is of the utmost importance that they be trained to "herd" properly. A troop whose herd has been trained to graze, and which can be driven anywhere by a few herders in a quiet, orderly manner, has a great advantage over one whose horses are wild and unmanageable. This advantage is of great importance when forage cannot be obtained in the field, or when in the enemy's country.

The grass obtained while herding also acts as a medicine in certain diseases, as it lessens the fever and aids recovery, while all cavalrymen know that a wounded horse recovers more rapidly on grass than on grain.

One of the most dangerous habits the horse can contract is that of "bolting" his food. This is caused, as a rule, by large feeds at long intervals. It may be prevented in several ways, one of which is to spread the grain over a hard surface. Another good method is to feed the grain with cut hay, thus insuring its proper mastication. The South African corn recently introduced in this country, called Kaffir corn, besides being a most excellent food for all stock, is especially valuable for this purpose when fed with the heads unthreshed.

The present nose-bag furnished the mounted troops is a very poor affair, and nothing will make a "bolter" of a horse in less time. It is so deep and narrow that confirmed "bolters" are often choked by eating from it, while many horses will not eat from it at all. A heavy piece of canvas twenty two inches square, bound on the edges with leather, and with eyelets around the sides, about four or five inches apart, through which a strong cord could be passed, makes the best kind of a feed box for the field. When in use the cord is pulled well up and fastened, thus causing the sides of the canvas square to roll up and form a kind of box, into which the grain can be put, and the box then placed upon the ground in front of the horse. When not in use the cord is unfastened and the canvas folded up and placed in the saddle pocket. Such an arrangement would also weigh less and be easier to pack than the present nose-bag.

During campaign it may often happen that we cannot obtain the regular ration for our mounts, and that they must live upon the country. If nothing but clover can be had be sure to allow it to wilt before feeding. It should be cut at least twelve hours before it is to be used. General DE BRACK, in his book, states that the "French cavalry, which arrived in perfect condition on the banks of the Niemen, to open the Russian campaign, lost more than a thousand horses in a single night from eating clover." Be very careful when feeding new hay. If possible mix it with old hay, and feed but small amounts at a time, as it is very difficult to digest. When nothing but new hay can be obtained, many authors recommend that it be moistened with salted water. Wheat, rye and oat straw chopped are fair substitutes for hay. Oat straw, as it contains more nourishment and is more easily digested than the others, is the best. Wheat and rye should be used in very small quantities, and then only after having been crushed. If possible feed them mixed with other grains or hay; otherwise they are most apt to produce laminitis and similar troubles. Carrots are excellent, and potatoes if steamed or boiled, very good, as food for horses.

When grass cannot be had, leaves will be readily eaten by horses. Those of the elm tree, according to most writers, are the best. Leaves of the cottonwood, oak, and of many vines, are also good, and General WOLSELEY says, "Horses, ponies, and especially mules, thrive well and can do hard work on bamboo leaves." The same writer also states that "horses have done work for some considerable time on the thatch taken off houses."

Cotton seed meal, corn, sorghum, cane and Kaffir corn fodders, are all good foods. When feeding the last four, standing or green, or in the case of second growth sorghum or cane, or growing wheat or rye, be very careful not to feed too much at a time, as their subsequent fermentation liberates gas in sufficient quantities to distend the stomach. All fodders are best fed chopped, but this would be hard to do in the field.

The most important thing, however, is to accustom your horses to the grain of the country in which you are operating, as early as possible, and to feed but lightly all food to which they are not accustomed, as sudden changes of diet are always dangerous.

It seems most probable that in the wars of the future compressed forage will be used to a great extent. Cavalry can then be sent on a short raid, or on any other detached service, without the usual forage train, as each horse would carry enough compressed food for

himself for four or five days. During the campaign in Egypt in 1882, the English cavalry were issued compressed forage in the form of cakes, the components of which were oats, bran and hay. A hay cake, made of compressed hay chaff, was also used in connection with the forage cake. Both of these proved most satisfactory, and four days' rations were carried on each horse.

In conclusion, I would state that after many experiments I find that horses can do more work, keep their weight and muscular power up to standard, and have very few, if any, attacks of "colic" when fed as follows: Morning, about three pounds of grain and three of hay; noon, about four and one-half pounds of grain and three of hay; evening, about four and one-half pounds of grain and eight of hay. The hay is to be always fed first.

PROFESSIONAL NOTES.

Owing to the change of station resulting from his promotion, Major CARTER has been compelled to relinquish the editor's chair which he has so efficiently filled for the last three years. Having the best interests of the Association at heart, his efforts to make the JOURNAL a success have been unremitting. The Association Council extends to Major CARTER its sincerest thanks for the able manner in which he has conducted the JOURNAL, and its best wishes follow him to his new field of duty.

It is hoped that the members of the Association realize the great difficulty the editor has in obtaining articles suitable for publication, and that they will do all they can to relieve this. There is a large number of subjects upon which articles are desired. Among this number might be mentioned the following: Reminiscences of Indian campaigns; lives of distinguished cavalrymen, as for instance that of General A. J. SMITH, who recently died at St. Louis, Mo.; signal instruction in the army; proper method of instructing the National Guard; methods of military instruction to be followed at schools, colleges and universities; military clothing for the cavalry; army athletics. Articles on any military subject will be gladly received, especially those that have been read before Lyceums and have been found to possess a high order of merit.

Attention is called to the prize offered, on the last page of this number, by the Association. It is proposed to give a prize semi-annually and publish the articles which are awarded first place, in the December and June numbers of the JOURNAL. It is intended to run through the entire history of the American cavalry in this way, thus making one of the most valuable histories a cavalryman could possess.

It is pertinent to mention that such an undertaking will cost something, and this must be met by increased subscription. I regret to state that twenty-five per cent of the cavalry officers of our army are not members of the Association. ED.

OUTLINE DESCRIPTION OF THE HORSE.

A certificate of description is a written instrument containing a concise, clear, accurate, and more or less complete enumeration of the external characteristics of the animal. For the purposes of the military service it may be limited to a simple indication of the external characters.

Such documents serve to prevent theft or substitution, and may become very important in disputes concerning redhibitory vices or when it is required to establish the identity of the animal in a legal manner.

A uniform order of enumeration should be followed; for example: 1. Sex; 2. Age; 3. Height; 4. The coat, its markings, blemishes, and brands; 5. Date.

1. Sex. We have:

(*a.*) The mare.

(*b.*) The horse, entire horse, or stallion.

(*c.*) The gelding, or emasculated horse.

(*d.*) *The gelding bistourné. Bistournage* is subcutaneous torsion of the testicular cord, leading to atrophy. In some countries the scrotum of the male sheep is removed by ligature.

(*e.*) The monorchid, or horse having only one testicle, which has descended into the scrotum. A horse with one testicle, the other having been removed by a surgical operation, would be called entire.

(*f.*) Cryptorchids; in this case neither testicle has descended. By horsemen cryptorchids are called *ridgelings*, which term is also applied to improperly castrated horses. Cryptorchids are troublesome but not fertile. The cicatrix of castration is sometime imitated in order to effect a sale.

2. Age. This is determined in the usual way by examination of teeth. Observers should be on their guard against the abnormal persistence of the cups (*beguité*); in such cases the age is determined by other indications, such as angle and cross-section of the incisors, appearance of the tusks, etc.

3. Height. The most reliable way of ascertaining the height is by use of the hippometer, which is a standard with a sliding arm to be placed on the withers of the horse. The animal should be placed on level groud, and the hippometer must be vertical when the measurement is made. Hippometric canes are used in the same way.

The Coats.

The coat denotes the whole of the hairs which cover the surface of the body. The colors are *black*, *white*, *red*, *russet* or *reddish brown*, *gray* and *yellow*.

We have:

1. *Primitive coats*, which the foal has at birth.

2. *Derived coats*, due to introduction of white into a primitive coat and appearing some time after birth.

3. *Conjugate coats*, or presence upon the same animal of two primitive or two derived coats.

Primitive coats, are divided into three groups { *a.* *Simple.* *b.* *Composite.* *c.* *Mixed.*

In *Simple coats* the hairs are all of the same color. We have only blacks and sorrels.

Of blacks we have:

a. *True* or *ordinary.*
b. *Rusty black.*

Of sorrels we have:

a. *Coffee-and-milk sorrel.*
b. *Light* or *fawn sorrel*, resembling the coat of a deer.
c. *Ordinary sorrel*, approaching the color of cinnamon.
d. *Bovine* or *washed sorrel*, resembling light sorrel, but the mane, tail and extremities are lighter, sometimes almost white.
e. *Dark sorrel*, cinnamon, bordering on brown.
f. *Cherry sorrel.*
g. *Chestnut sorrel*, like a ripe chestnut.
h. *Maroon sorrel*, like chestnut, with dark spots.
i. *Burnt sorrel*, color of roasted coffee. Mane and tail sometimes white.

In *composite coats* the hairs of the body are yellow, red or gray; the mane, tail and extremities are always black. We have the *Isabella* or *dun*, the *bay*, and the *mouse color.*

Of the Isabella we have:

a. Light. } Mule rays, zebra stripes and ear borders often
b. Ordinary. } accompany this coat, which is some shade of
c. Dark. } yellow.

The bay differs from the Isabella, in that the hairs of the body are red instead of yellow. We have:

a. *Light bay.* Light red color. Often resembling the dun.
b. *Ordinary bay.* Distinctly red.
c. *Cherry bay, blood bay, mahogany bay;* they are almost identical.
d. *Chestnut bay*, light brown.
e. *Maroon bay*, same as preceding, with some deeper shades.
f. *Dark bay*, bordering on brown.
g. *Brown bay*, almost black. Reddish color about the nostrils, elbows, flanks and abdomen.

Of mouse color we have:

a. Light. } Head sometimes darker; mule rays and zebra
b. Ordinary. } stripes not uncommon.
c. Dark. }

In the *mixed coats* the individual hairs are yellow near the body and black at their extremities. Many varieties are found in different animals, but in the horse there is only one, *fox-color* or *louvet.*

We have:

a. Light.
b. Ordinary. } Mane, tail and extremities ordinarily dark.
c. Dark.

Derived coats are those which appear after birth and result from the introduction of white hairs into a primitive coat. We have:

1. The *gray coat.* This is composed of white hairs and hairs of a darker color.

2. The *white coat.* With rare exceptions is only to be found at an advanced period of life.

3. The *flea-bitten coat.* Composed of red and white hairs mixed; mane, tail and extremities of same color, or lighter.

4. The *roan coat.* Red and white hairs on the body; black hairs in the mane, tail and extremities.

Varieties of the above coats. In the grays we have:

a. Very light gray. Resembles white; very few black or dark hairs.
b. Light gray. More dark hairs than the preceding.
c. Ordinary gray. Equal mixture of white and dark hairs.
d. Dark gray. Predominance of dark hairs.
e. Iron gray. Has a bluish shade.
f. Slate-colored gray. Has dull blue shade of slate. Varies from light to dark.
g. Clayey gray. Has a very light yellowish tint.
h. Isabella gray. Resembles the dun.
i. Roan gray. Mixture of white, dark and reddish hairs. In one of the varieties, the *wine gray*, the red is quite marked.
k. Flea-bitten gray. A dark roan gray with small white spots.

Of the white coats we have:

a. Dull, milk, or *pigeon white.*
b. Porcelain white. Black skin visible through the coat.
c. Dirty white. Slightly yellowish tint.
d. Rosy white. Large spots of pink skin visible through the coat.

In the flea-bitten coats we have:

a. Light.
b. Ordinary. } According to proportion of red in the coat.
c. Dark.
d. All-flower. Small patches of white scattered over the coat.
e. Peach blossom. Small patches of red on the lighter ground-work of the coat.

Of the roan coats we have:

a. The *light roan.* The white hairs predominate.
b. The *ordinary roan.* Equal parts of red and white hairs.
c. The *wine, blood,* or *strawberry roan.* The red hairs predominate.
d. The *dark roan.* Brownish red hairs predominate.

The *conjugate coats* are comparatively rare; the best known are the various kinds of piebald coats.

PECULIARITIES OF THE COAT.

These should be noted on the certificate of description:

Of brilliant reflections we have: Jet black, silver, golden copper, bronze, wavy.

The *dapple coat* is formed by round spots about the size of a silver dollar, of lighter or darker shade than the coat.

With reference to the presence of white hair we distinguish:

Solid color, no white hairs.

Rubican, with isolated white hairs.

Snow-flaky, light or heavy; spots of white strewn over the coat.

Flea-bitten, local areas of small white spots on the bay or sorrel.

Grayish, local areas of grayish shade.

Accidental white markings, caused by the saddle, harness, hobbles, or injuries.

With reference to the presence of black hairs on the coat we have *speckled*, *ermined*, and *leopard-spotted* coats. Similar markings may be made by spots of red hair.

The following peculiarities should also be recorded:

1. The location and form of brands.
2. Peculiarities of dentition such as wolf's teeth, cribbing, double teeth.
3. Scars, bare spots, splints.

White Marks on the Head.

ON THE FORE HEAD.

a. As to extent we say:

Some hairs, scattered, medium, prolonged, interrupted, large.

b. As to form we say:

Irregular, blaze, star, list, crescent, flame, heart, bifurcated, pointed.

c. As to situation we say:

High, low, to the right, to the left.

ON THE FACE.

A white mark on the face is called a *list*. We distinguish: Small list, wide list, semi-white-faced, and white-faced. As to length it may be complete, incomplete, or interrupted. A white streak on the nose or upper lip is also called a *snip*.

The white marks also may be pointed, dentated, ermined, spotted, etc.

Fox-nose is the rusty coloration about the nostril of dark horses.

Moustaches are tufts of long hairs on the upper lip.

Moor-headed applies to horses when the head is black or very dark.

Wall-eye. The iris is bluish white instead of brown.

Mule ray is a dark stripe from withers to tail.

Cross upon the withers. In addition to preceding a dark stripe runs down the shoulders.

White or *washed mane and tail*, when the mane and tail, instead of the usual black, is white or of light shade, in black, bay, dun and mouse-colored horses.

Zebra marks are transverse stripes of black color on the legs.

WHITE FEET.

Number and position to be indicated.

Subjects with only the posterior right foot white were formerly called *arzel* and considered very unlucky. The Mexicans call a horse with four white feet *quatralvo.*

As to extent of the white foot we say:

Incomplete, interrupted, trace, beginning, small, white foot (when it extends to fetlock), large (or half stocking), stocking (to knee or hock), high stocking (above knee) and very high stocking (near body).

The color of the horn of the hoof is the same as that of the skin of the coronary band. It may be white, black, or mixed.

J. T. DICKMAN,
First Lieutenant, Third Cavalry.

"THE HUMAN ANIMAL IN BATTLE."

Under the title of "The Human Animal in Battle," Mr. H. W. WILSON has in this month's *Fornightly Review* gone into a very important military subject which has not as yet received as much attention as it deserves. The best drilled parade army is useless in the field if devoid of courage. It is rather a bold assertion—and yet we believe that our readers after examining it carefully will admit its correctness—to say that practically all men are naturally cowards. This will be considered a humiliating remark by civilian Englishmen, for the nation at large considers that every unit of it is naturally brave, whilst among the higher classes an accusation of cowardice is regarded as the most deadly of insults.

Mr. WILSON observes truly that courage is simply control of the nerves, and is largely due to the habit of confronting danger. He quotes General SHERMAN, who thus defines courage:

"All men naturally shrink from pain and danger, and only incur their risk from some higher motive, or from habit, so that I would define true courage to be a perfect sensibility of the measure of danger, and a mental willingness to incur it, rather than insensibility to danger, of which I have heard more than I have seen."

It is nevertheless the case that some men are, *pace* General SHERMAN, naturally insensible to danger. The writer of this article has known personally two instances of apparent unconsciousness of peril. In both cases they were men who obtained the Victoria Cross, and both possessed magnificent physique. One was a dull man with no cultivation of mind, and wholly destitute of imagination. It was probably the sluggishness or absence of imagination which prevented him from anticipating or realizing peril, and which made him brave. In the other case there was plenty of ability and culture, much quickness of perception, and his intrepidity may be attributed to his fine physique and pride of race. A third case may be mentioned, that of a man of high culture and power of imagination, whilst also a man of very fine physique: we refer to Colonel WILLIAM HOPE, V. C. The writer of this article was present once when Colonel HOPE tried a gun which he had invented. Colonel HOPE insisted on firing it off whilst standing at the breech, in spite of remonstrances. He realized the danger and made all spectators retire under cover. As to himself he saw that if the inventor did not show confidence he could not expect confidence from the soldiers and sailors who he hoped would work it in the future. The gun burst, and when the spectators hurried up Colonel HOPE was seen with a cut from a splinter on his face, and pale with disappointment, and yet as calm and resolute as if he had not just escaped death by a miracle. We must, however, in the main agree with SHERMAN, who maintained that everyone shrinks from danger, and with SKOBELEFF, who considered that there were some men who could never overcome fear and were useless as soldiers. In our view courage is not natural to the many. It is only acquired by familiarity with danger, national or personal pride, *esprit de corps*, strong religious belief, and discipline. Further, we are inclined to hold that in the matter of courage most races are very much alike. The Egyptians under ARABI were worth little, but under British training and example those of KITCHENER have become formidable to one of the bravest races of the present day, the Soudanese. Certain natives of India, fighting against us, have at one time displayed the greatest poltroonery, at others—especially when forced to a resistance *à outrance*—they have behaved like heroes. When fighting on our side the native regiments, especially the Goorkhas, Sikhs, and Pathans, have fought magnificently both in the offensive and on the defensive. As Mr. WILSON points out, religion is a very powerful incentive to courage. The horsemen of old believed that they only lost life on earth to obtain a more joyous one in their Valhalla. The Mohammedans are assured that if they die when fighting the infidel, they will pass at once to Paradise. The Crusader reckoned earth well exchanged for Heaven. Now, however, among European races doubt or infidelity cause many of them to feel uncertain about the future, whilst being certain that this life may be ended in battle. Familiarity breeds contempt or indiffererence, and a soldier having escaped peril once or twice, thinks that he is destined to survive the campaign. The man who believes not

in religion, believes in fate, and in that wholesome soldier's proverb that "every bullet has its billet."

Turning to the battles of the future, Mr. WILSON points out that few men now survive who know from experience what war between two European armies means, and that probably the horrors of the combat will be largely increased. Moreover, he considers that with the increase of terrors there is a weakening of the nerves:

"To meet that trial the nerves of the modern civilized man are less fit than they were in the past, as the increasing rush and worry of our existence, the railway, the telegraph, the herded aggregations of human beings in cities, conduce to nervous complaints. * * * To counteract this downward progress, training and discipline grow ever more and more necessary."

That training and discipline coupled with national pride and *esprit de corps* will do much, is proved by the gallantry of our men at Alma. Of the army that fought in 1854, scarcely any but a few officers of rank had ever heard a shot fired in battle, and yet how well all ranks bore themselves. The same may be said of our cavalry at Balaclava—practically their first action.

It is certain nevertheless that the more men have been accustomed to danger apart from the risks of battle, the better they will conduct themselves on the battlefield. Hence Mr. WILSON points to dangerous sports and adventures as an admirable preparation for war. Fortunately for us most of our national sports contain some element of danger, and we are therefore to a certain extent better fitted to face the perils of the battlefield than are other nations. This is a strong argument against those who protest against certain sports as involving a risk of life. It should be remembered also by commanders of troops without experience of war, that the nerves both act and are acted on by the stomach. Care should therefore be taken to bring men into action as far as is possible free from excessive fatigue. It is no disparagement to Englishmen to say that they always fight best when well fed.—*Journal of the United Service Institution of India.*

WASHING HORSES.

Washing should be avoided, especially immediately on return from muddy field days. As much of the mud as possible should be scraped off, and the rest allowed to become thoroughly dry, when it may be brushed out. The skin affection known commonly as "mud fever" is almost always caused by grooms washing off mud and neglecting to thoroughly dry the parts afterwards. Cracked or chapped heels are caused in the same way, and are nearly always a sign of laziness and neglect in the groom. The practice of "hanging horses out to dry" on return, wet and sweating from a field day, is a most pernicious one. On warm bright summer days, and when the wisp is well used at the same time, there is not so much objection, if done under supervision, but the time usually chosen is

when there is a nice cold wind blowing, easterly or northerly for preference, and the man amuses himself by toying with the legs and feet while the wind dries the body. This is not an overdrawn picture. I have seen it again and again. Sometimes it is done openly, but more often surreptitiously, and the non-commissioned officers wink at it. The practice should never be allowed, except when properly authorized, and under the supervision of the officers. The feet should be thoroughly dried when washed out.—*Aldershot Military Society.*

THE ROLE OF CAVALRY IN AUSTRALIA.

This is a great, useful and powerful arm in the defense of the Colonies, either for scouting along the coast, inland reconnaissance, or in battle, strategy and tactics. I do not like the idea of blending this arm with that of mounted infantry under the name of "Mounted Infantry Brigade," because the blending of the two arms is apt to confuse both officers and men with regard to their true, proper and special *role* in war which, let me say at once, has been the subject of much dispute between staff and cavalry officers. Speed, smartness and rapidity of decision at the right time and place, in the front of advancing armies, is everything to a G. O. C. I know of no arm from which such keen vision, prompt military intelligence, and heroic resolution is demanded as from cavalry—the eyes, and yet the screen, of active operations. Cavalry were well worked by PAGET, SOMERSET and COMBERMERE in the Peninsula, but it was not well handled in the Punjaub or Crimean Wars. Cavalry did noble service in the Mutiny, in WOLSELEY's Egyptian campaign, in the Afghan War (less the command of General Burroughs) and in the Chitral War. The *role* of cavalry was uncertain after Sadowa; and after Gravelotte and Sedan it was considered an arm fit for powder. But since 1890, the best cavalry officers have proved that it is not useless in modern war. French cavalry had to sacrifice itself at Woerth and Sedan, just as VON BREDOW sacrificed the flower of the German cavalry at St. Privat or Lord CARDIGAN the Light Brigade at Balaclava. What MARLBOROUGH and VON SEIDLITZ taught the world in the use and destructive power of cavalry in European war, applied to the leading and operations of cavalry in the American Civil War, the Chinese War, and in Rhodesia. Mounted infantry displayed their *role* more in the last Russo-Turkish War than cavalry, but what could WOLSELEY have done in the rapid and essential capture of Cairo only for the cavalry *role* and dash of WATSON and DRURY LOWE, after Tel-il-Kebir. It does not follow that in consequence of the long ranged rifled guns and rifles, Maxims and Hotchkiss quick firing guns, charged with normal smokeless powder, that cavalry leaders must become food for the enemy's powder in the forlorn front. Our modern PAGETS, HOPE GRANTS, THACKWELLS, BATTYES, BAKER RUSSELLS, LUCKS, FRASERS, HODSONS and BURN-MURDOCKS must learn how to find out at all about the wily foe, read the strategy of the enemy, and maintain his ground

traversed, with or without the aid of mounted infantry, and without repeating the heroic sacrifice of Von Bredow in 1870. The masterly handling of cavalry in the Corunna retreat, and on the Lom by General Valentine Baker saved the Turkish army. Cavalry in a midnight charge at Kassassin saved the infantry of Sir Gerald Graham, and if Lord Chelmsford had had cavalry in Zululand there would have been no Isandula. Sir Evelyn Wood could have driven the Boers from their strong position on Laing's Nek with cavalry. In the next Boer war there will be no more Majuba Hills nor Kugerdrops.

Mounted or police cavalry are no use without fifteen-pounder field gun in front, with lancers backed up with hussars and mounted infantry working and charging the Boers, amongst the earthy outcrops, from the flank or rear. It is a fatal mistake for infantry to stand up in the open to be shot down by Boers under cover. How to beat the Boers is to pepper them well in front with machine and quick-firing guns, whilst the cavalry—lancers and hussars—take their positions by flank movements. When the lancers are in amongst them in the rear, the British guns to stop firing, when the lance and sword will do better work than crack shots and infantry, or if the infantry cannot get at the Boers with the bayonet. I am glad that a lancer and a hussar regiment are now in South Africa. I have for some time kept my eye upon the New South Wales cavalry—the lancers—and I am just afraid that they want cohesion, mobility, alertness in responding to the flying word of command, and practice in bush reconnoitering. Captain McNeill, when he was here, had the lancers very well drilled in scouting and field discipline, but now the lancers are not out at drill often, yet they are too few upon parade to learn their true *rôle* and war duty expected of them. There is plenty of room in this country for cavalry to learn their duties upon horseback. The open bush would gladden the heart of an Aldershot cavalry adjutant or a Chalons Galliffet. We have the open bush land to maneuver all the cavalry of France and Russia combined, but we in Australia have not the cavalry squadrons nor divisions to light up the landscape with gay lances, nor charging reports. The New South Wales lancers are too few numerically to be up to date in cavalry operations. Lancers must understand that they exist not for show, but for real and continuous hard work to fit them for their dangerous and responsible duty as "the feelers" of an army. Young Australians should make good troopers, either as lancers, hussars, or dragoons. They cannot only stick to the pigskin, rough it like a digger or a back block stockman, put up with hard fare like a Mount Brown tramp or a Barcoo farmer, but they can read the bush horizon like an emu or a lyre-bird, to say nothing of a dingo or an old man kangaroo; but if the officers can think and study the plan of an enemy in his front like a Hudson or a Paget, "my colonial" should make an intelligent cavalryman. They are all anxious to learn the *rôle* of cavalry, but they get no chance to drill in numbers as cavalry regiments should and must do. The arm must be

brought more together, and the men made to know the different *rôle* of cavalry and mounted infantry and also how to act with home artillery and the three main armies of the service in the field. It is painful to see a dozen or two lancers turn out for drill now and then on the old Paddington range. I give the men credit for their devotion, but regret the wasted time and drill owing to the want of more complete troops and squadrons. Every Australian if they desire to be smart cavalry leaders should closely study the achievement of cavalry.

Sir EVELYN WOOD recounts in vivid and telling language the story of VON BREDOW's famous charge (August 16, 1870) against the guns and infantry formed on the ridge north of the Vionville-Rezonville road, whereby his six squadrons relieved the overpowered German left flank, and by wrecking six batteries and four battalions checked the advance of the Third French Corps. That VON BREDOW led his men with splendid determination and remarkable success is manifest; but Sir EVELYN has no doubt that the pace was too hurried, and that the horses were unnecessarily distressed before he closed on the enemy. "The instructions given were partly the cause of the heavy loss incurred, for had the brigade been rallied to its right after it had ridden through the infantry a greater portion of it might have got back. It is difficult to excuse the senior general on the spot for not supporting VON BREDOW, as the Sixth Cavalry Division was close at hand." Sir EVELYN believes that, if the devoted brigade had been supported, some of the forty-two guns it wrecked would have been brought back to Vionville, and probably with half the loss actually suffered. The loss was about fifty-four per cent. The cavalry arm is indebted to Sir EVELYN WOOD for his admirable exposition of some of its most brilliant achievements.

In scouting and reconnoitering, Australian lancers should learn their duties faithfully. Let them learn this, that when scouts are attached or mask the enemy's position they must withhold their advance in front whilst they uncover the flanks of the foe advancing. In broken country, on plain, or at night, the moving advance is stopped and replaced by patrols, through whose lines no one must pass, and who should never let a camp be surprised, care being taken, however, to prevent false alarms. When once scouts or patrols touch the foe, that touch should be kept and not lost sight of until the G.O.C. knows all about it. Cavalry scouts should avoid combat, and if a position is to be held, the mounted infantry should come up and do so, whilst the cavalry might follow the tactics of a SEIDLITZ. It is on important front tactics that officers and men distinguish themselves in war, as Lieutenant RHODES says: "Unless the patrol be a secret one, it should not, on meeting the enemy, fall back and report, but should keep as near as circumstances will permit, reporting to the rear by means of couriers. It is truly said, that it is only after contact has been made, that the duties of the advanced patrols begin. The Germans make a distinction between forced reconnaissances and reconnaissances of observation. The former seek an engagement in order to force the enemy into a premature

deployment, while reconnaissance of observation have duties indicated by their name. In his letters on cavalry, Prince HOHENLOHE comments on the fact that the reconnoitering and security services are not sufficiently separated. The reconnoitering patrols having for their object the obtaining of information, are pushed too far to the front in contact with the enemy; while the security patrols, having for *their* object the safety of the command, are pushed forward only a prescribed distance. The officers' patrols, following the advanced scouts, make reconnaissances of observation. They consist usually of an officer and a small squad of cavalrymen. These patrols do not fight, but depend for safety on concealment, their marches often being made at night.

Special cavalry reconnaissances are also often made, especially when there is the likelihood of a battle, having for their object the gaining of information as to the physical character of the ground; and they introduce into their duties, more or less, topographical sketching, varying in accuracy from a hasty horseback reconnaissance to a completely finished survey. For the planning of marches and location of camps only such information as the character of the roads, fuel and water supply, fords, bridges, etc., is necessary. But in planning a battle a cavalry reconnaissance which will secure a more or less rough map of the topographical features of the ground, will be of the greatest importance.

Pace is a thing ill understood in Australian cavalry. It has to suit the demands of order, cohesion, and maintained strength of horses to meet the shock of opposing cavalry. A full gallop gets into serried ranks and less compact formation, with the result that both horses and men get out of leading and fighting direction. They lose temper and *morale*. A good, steady, dashing and effective charge demoralizes the foe. Uncontrolled charges are useless for destructive power, for cavalry can defeat galloping cavalry at a trot. Our lancers want to know how to do this. SCARLETT met the furious Russian cavalry at Balaclava almost at the trot, and defeated them by three to one. Leaders must know how to glean the decisive and impulsive moment in war by selecting the proper time to charge, and the battle occasion by the hand. NAPOLEON said that "cavalry charges are equally good at the beginning, middle and end of a battle," but they cannot go at infantry flank when they are engaged in front. WELLINGTON disagreed somewhat in the opinion that cavalry leaders should be left to themselves when to charge in the front, as such action might sadly derange the plans and tactics of a G. O. C. MOORE and WELLINGTON always ordered the charges of PAGET and CUMBERMERE, and WOLSELEY ordered DRURY-LOWE to march upon Cairo. The glory of success oftentimes makes cavalry go forward too far, and brings on a general action when not wanted, and with fruitless campaign results. WELLINGTON was great in defense, found victory in it, but we believe in the offense battle like NAPOLEON, FREDERICK, MOORE, CLYDE, ROBERTS, and other great heroes. The defense of Torres Vedras forged victory for WELLINGTON. I hope that a cavalry leader will have a

large discretionary power in charging the foe far in the front, far from headquarters, and using his own intelligence and dash in advancing or retiring. They should have the military eye of a SEIDLITZ or a WELLINGTON to read the field of battle, and also the hidden tactics, or plan of campaign of the enemy.

Pace in cavalry is everything, considering the sudden and dangerous work which lancers and mounted rifles will be called upon to do in action, advance and reconnaissance. Pace is all important in the sudden dash and charge in face of quick-firing machine and magazine guns. Pace, with well controlled cohesion in cavalry, adds weight to the charge, and helps to ride down the enemy. But pace means a good horse, with plenty of weight, bone and breeding. Cavalry must be composed of both light and heavy horse. Heavy horses told in SCARLETT's brigade when they dashed in front and on flank of the Russian cavalry on October 25, 1854. The Union brigade at Waterloo were "heavies," and the pace wonderful. I saw the Austrian and Prussian horse charge each other twice in 1866. The Austrian pace and smartness—light horse—nearly overthrew the heavy Pomeranian horse.

The old pace used to be eleven miles, then fifteen miles, and now modern cavalry officers want twenty miles per hour out of the chargers, simply because light troops must jump about in scouting like lightning, and the "heavies" in charging must gallop hard in the face of improved gun fire. Pace means a deal to a G. O. C. But how are commandants in Australia to get uniform pace and strong cohesion in the mad-like rush of charge, with grass fed horses, which are the steeds of our cavalry and mounted rifle corps? The Easter maneuvers proved in the majority of cases that grass fed horses will never do in war after four days' constant reconnoitering and galloping about. We know what grass fed horses can do upon long journeys in the bush. I once rode 280 miles in Queensland in four days, but our well-bred horses had to get two weeks' spell on grass before they could travel fifty miles per day for two weeks. Some stockmen tell some curious tales of horse endurance "out after cattle," but the average grass fed horse in recent camps could not do fifty miles per day for two weeks and be ready for "pace" when they felt the foe in front. Horses can be trained for pace and long journeys, but how many of the colonial mounted brigade animals are so trained, with plenty of wind, limb soundness and robust constitution? Give a grass fed horse two days' rest out of three, and they may be reliable for pace and sudden endurance; in fact, our bush chargers want height, barrel, physique and weight, to go upon a month's campaign. A little Indian corn and oats will improve bush cavalry. But twenty miles per hour wanted as by FRASER from grass fed horses is open to a doubt at present.

I have mentioned the lancers specially in this article, but whilst New South Wales arms its cavalry with lances, what about the second rank being armed with swords in cavalry action? The following extract from Colonel NEVELLE's paper on "The Rear Rank in Action," should be read by every cavalryman in the Colonies.

He says: "During the advance that the rear rank is necessary for the purpose of filling gaps caused by casualties or opening out in the front rank is generally admitted by cavalry officers. It is likewise admitted that at the moment of collision this rank is practically wasted, the men being of no stock value. If they charge home it is on top of their own front rank, which is thereby hampered if not injured, and if the regulation distance of eight feet is preserved, it is almost impossible for the rear rank to pull up when moving at charging pace so as to avoid this. If the troops are armed with lances it is extremely difficult for the rear rank men, jammed up as they are against their front rank, to make any use of their weapons."

Various suggestions have been advanced from time to time with a view to obviating this defect. Amongst these may be noticed (*a*) the armament of the front rank with lances and the rear rank with swords; (*b*) that the rear rank, if lancers, should sling their lances and use their swords, and (*c*) the adoption of a single rank formation. None of the above are satisfactory or practicable. The first (*a*) is all very well for a march past, but in action the filling up of gaps and the rally after a charge would eventuate in a confusion of lances and swords in the rank. It also happens in every collision that lances are broken or lost, which accentuates the undesirability of such an arrangement.

The second (*b*) is faulty because the lancer is taught to believe in his lance as the queen of weapons, and if he has to use a sword in lieu thereof his confidence is gone; he has little proficiency and no trust in the sword, and his lance, swinging on the elbow of his bridle hand, seriously hampers him in the management of his horse. The employment of a single rank is universally condemned for many reasons, which it is inexpedient here to discuss. Which then is the true solution of this question of the rear rank? It is necessary, as we have seen, during the advance; it is useless, if not dangerous, at the moment of collision when it removes some two-thirds of the combatant force from the line of shock action.

It will be well here to go back to the days when cavalry took the highest rank as a fighting arm—to the days of chivalry. Here we see the heavy armored knights on powerful horses, armed with long tilting lances, charging in line. They were followed at some fifty or sixty yards by a second line, composed of their esquires and men-at-arms on smaller horses. This second line (or rear rank) had no lances; they were armed with sword, battle-axe and mace. The first line of knights was used to break the enemy's line and throw them into disorder; the second line then coming up entered into the *mêlée*. If the charge was successful they completed the victory for the knights; if, on the contrary, it had failed they disengaged their masters and enabled them to rally for a new onset."

Cavalry formation in the attack is just the same to-day as ever it was. The charge must be formed up outside the zone of infantry and machine-gun fire, behind shelter or cover. The charging distance is still best at 300 or 400 yards from the foe; but long-range

fire will make the charging distance longer, and, therefore, more severe in killed and wounded in battle action. The leader will steal as much under landscape cover as he can, with an eye and intellect to seize the advantage at once. It will be a difficult matter to hide 6,000 horsemen from the opposite side; but it is almost impossible to manage such a huge cavalry force with order, cohesion, and intact heavy hitting power in the irrepressible gallop and Rupert charge. Disordered ranks in a cavalry charge almost means its overthrow, destroys its intervals, and induces the foe to send in the whole of his reserves to complete its disorder and fatal charge. It must be a grand sight to see 6,000 French, German, Austrian, or Russian cavalry at a review in full gallop towards the saluting point, and suddenly pull up in line or column, without disorder in the ranks, as was done before the Czar, at Chalons, the other day. We shall never see such a cavalry discipline in Australia in our generation; but colonial cavalry should be trained to do this, even in squadron numbers. NAPOLEON and the Archduke CHARLES are said to have reviewed 12,000 men in review; but such numbers are hard to work in action. The chief points of cavalry battle formation are sufficient speed to attack the foe in flank; the second squadron to follow after the first, and in the event of its defeat to keep up the charge, whilst the first squadron retires by the flanks or through its intervals; and the third or reserve squadron to deploy at 400 yards from the charge, and drive it home. As JOHN, Duke of Argyle, said, "If it were na weel bobbit, we'll bobbit again." It all depends upon the nature of the field, and attack whether to form cavalry in *echelon* or in extended formation. A British cavalry regiment consists of four squadrons of 440 sabers, and a brigade of three regiments, and one battery of horse artillery. There are only 2,600 cavalry in an army corps, as against 880 in a German army corps. The cavalry formation liked by JOMINI was one-fourth, and deploy one-fourth in column on each wing, and one-fourth in reserve; or out of forty squadrons, ten to be in line, ten in column on each wing, and ten in reserve in rear of the center attack, but all must sooner or later deploy for the grand and overwhelming charge.

It was MARMONT, who said that "cavalry should never fight in column as it prevented good marching and good deployment in front of the enemy." It is also fatal to change formation in front of the foe at 400 yards distance, as the troops are not steady enough to attack or defend when the attack is once committed. Cavalry must be very poor indeed if they cannot successfully charge broken or shattered infantry. Lord NAPIER, of Magdala, said of cavalry in pursuit: "Follow the broken enemy up, hit them hard, give them no time to rally; defeat, scatter and disperse them at all risks." This he always did. What SCOBELLEFF did at Goke Tepe; what DRURY-LOWE did in Eygpt, and what Lord STRATHNAIRNE did in Central India. The value of effective pursuit is lost if the enemy is allowed to rally in the line of retreat. A river does not stop cavalry in India. The only thing to stop cavalry in pursuit, *a la* CURETON or GILBERT, is a Plevna or Kaferdower. Modern science

has not done much for cavalry as an arm of the army, but Colonel NEVILLE, of the Bengal lancers, has done much to improve cavalry attack and defense. The cavalry of MARLBOROUGH and EUGENE was too slow in movement, but it was left to SEIDLITZ, FREDERICK and NAPOLEON to improve the *role* of cavalry in war. MURAT nor KELLERMAN knew its value from SEIDLITZ and his dashing horsemen, as they won successes by more maneuvering than in charging home. It will be terrible work for cavalry to charge an infantry square of Lee Metfords, Mannlichers, Machine and Hotchkiss guns or rifles. It was last done by Lieutenant MALCOLMSON in Persia, in 1856, and I do not think that VON BREDOW's will be repeated in the next great war. HAMLEY favors the cavalry final attack in open instead of close column — in successive lines of supporting charging squadrons, as the best deep formation, with intervals in the front line which are one-fourth of a squadron in separation. The Australian bush is highly suitable for *echelon* cavalry formation, with the front supported by a second, and the leading must be prompt, firm, initiative — heroic! How can the Sydney or Maitland lancers acquire this discipline without camps of continuous training? How can they learn cohesion and the art of driving the charge home without such instruction in peace time. The whole defense force is going to the dogs for the want of field drill and operations. False retrenchment will ruin the force. All the work of General HUTTON and his staff officers is being undone; in fact, his mobilization scheme has never yet been put into practical force either at Newcastle or at Sydney. How can cavalry learn to protect infantry flanks or work round the enemy's flank if they receive no practice; and can infantry learn to protect the charges of cavalry if they do not know how? All arms of the service must help each other in war, and men of all ranks must learn to read the signs of battle. I have penned these lines, and given some extract from great cavalry writers with the view to review the whole question of the cavalry arm, its *role* and value, in our defense forces. It is right that our young men should know this. Both corps have a special interest for Australians in choosing a corps to serve in defense of Queen, Empire, and Australia. Next week I shall send you an article upon the *role* of mounted infantry in probable colonial war. — *George C. Craig, Defense News, Sydney.*

THE CAVALRY CURB BITS (MODEL 1892).

The following circular was issued some time ago by the Ordnance Department:

"These differ from the Shoemaker bits principally in the proportion existing between the lengths of the upper and lower branches. There are three sizes which are precisely alike, except that the length of mouth-piece of 'No. 1' is four and one-half inches; of 'No. 2,' four and three-quarter inches, and of 'No. 3,' five inches.

"Bits of this model should first be adjusted to the horse's mouth, so that the length of mouth-piece shall correspond, as closely as possible, to the width

of mouth; that the mouth-piece shall rest properly on the bars of the mouth; and that the curb strap shall be neither too loose nor too tight.

"It is requested that any defects which may be found in these bits after thorough trial in service may be reported to the Chief of Ordnance, U. S. A., Washington, D. C."

As many troop commanders have continued the use of the Shoemaker bit, it is believed that the 1892 model has not given entire satisfaction. In this connection it should be remembered that the only way in which defects can be cured in any article of equipment, is to properly represent the facts to the department which supplies the particular article. In this instance reports are requested, and a failure to secure what is desirable will lie with those entrusted with the use of the bits.

Since the establishment of lyceums nearly everything connected with the service has come in for a share of criticism in a general way, but this very fact has taught officers that criticism easily degenerates into idle fault finding, and that unless pertinent facts and practicable remedies are submitted in each instance, it is wise to refrain from indulgence in a habit so easily acquired.

Discussions and reports of experiments published in the JOURNAL will always enable officers to compare experiences, and in that way it may be determined what is wanted by the greatest number. Whenever it becomes apparent, from publications in the JOURNAL, that the cavalry arm is in unison, it would be perfectly proper and legitimate for the Council of the Association to so represent the facts to the War Department. W. H. C.

HUNTSMEN BECOMING TROOPERS.

The memory of dashing HARRY GILMOR, the Confederate cavalryman, still lives in Maryland. No braver cavalier ever followed the plume of RUPERT or sat with the gay spirits who "drank red wine through their helmets barred" at ARTHUR'S round table, than that bold and accomplished knight of the saddle.

The war between Spain and Cuba has set everybody to reading the history of the cavalry service during the Rebellion; UNCLE SAM is burnishing up his sabers, grooming his horses and giving his men riding lessons; while some of the hunt and riding clubs throughout the land have caught the inspiration and are organizing troops with a view to enrollment as regular arms of the various State militia.

The members of the Green Spring Valley Hunt, together with a number of Maryland riders, held a meeting at the Club's Kennels, near Pikesville, on the 13th instant, for the purpose of organizing a company, which is to be known as the Green Spring Valley Troop. By-laws were presented, and a petition was signed by twenty-one horsemen binding themselves to enlist for a period of three years.

The organization will be governed by both civil and military

officers, the highest positions in each set being the same ex-officio, viz: president, vice-president, secretary and treasurer; the commissioned officers will consist of a captain, first lieutenant, second lieutenant, bugler, surgeon and quartermaster; and the non-commissioned, a first-sergeant, five sergeants and four corporals.

Under a recent act of the Maryland Legislature, membership is limited to sixty. Their mounts will be individual property, although the State will otherwise equip them and probably provide an armory.

The following well-known 'cross-country riders have enlisted: Messrs. REDMOND C. STEWART, MAMI JAUNEY, RANDOLPH BURTON, Jr., W. PLUNKETT STEWART, EDWARD A. COCKEY, ALBERT T. MYER, C. MORTON STEWART, Jr., JAMES L. ROGERS, Dr. WILLIAM LEE, ARTHUR BROGDEN, W. STEWART DIFFENDERFFER, DUNCAN K. BRENT, J. M. PARR, Jr., Dr. CHARLES R. HILL, Dr. H. BURTON STEVENSON, W. P. E. WYSE, JOHN MCHENRY, WILLIAM LEE, Jr., and C. LYON ROGERS, Jr.

When the organization is completed the men will be drilled every week until the early summer, beginning with infantry tactics, under the tutilage of an officer of the Maryland militia, which will be followed by instruction in cavalry movements by officers of the United States cavalry. The first drill of the troop with horses took place on the 21st instant, under the direction of an officer of the Ninth Cavalry.

As the Green Spring Valley is noted for its superb horses and skillful riders, many of whom have had some military training, either at college or as members of the Fourth and Fifth Maryland regiments, it is likely that their proficiency will be such by the 4th of March as to warrant participation in the great parade on Pennsylvania avenue which will escort MCKINLEY to the presidential chair.

In six months time the troop will no doubt be prepared to offer its services to the Governor and Adjutant General for enrollment, as a regular arm of the National Guard of Maryland.

This is a happy movement on the part of the Green Spring Valley Club, and the local interest it has already awakened indicates that it will prove eminently successful.

They have ample material of the highest class to draw from; for the means, the opportunity and the training are all at hand, which should enable then to fully develop their praiseworthy plan and become the peer of any volunteer command in the country.

I say it is a happy movement, because its purpose, which is twofold, will contribute to the splendor and strength of Maryland's magnificent militia, as well as promote and keep alive the interest which is now spreading throughout the South in the breeding of fine horses.—*The Rider and Driver.*

TROTTERS BRING GOOD PRICES.

The sale of trotting-horse stock, under Messrs. W. B. FASIG & Co.'s management, at Madison Square Garden, last week, resulted most satisfactorily. The majority of the horses were well bred, with fast records, and those that gave evidence of being able to improve their past performances brought good prices.

The feature of the sale was the very prominent part taken by European buyers or their American agents. During the first day the foreigners picked up some rare bargains, notably the mare Fly, for which Mr. BERNHARD POLLOCK, of Vienna, Austria, only paid $230. This mare is a granddaughter of the great Electioneer, out of Mecca by Mohawk Chief. She has a record of 2:29¼, but has shown far greater speed in private. Another likely mare bought by Mr. POLLOCK is the six-year-old mare Guard, by Clay King, out of Hannah D., by Abdalbrino, for which Mr. POLLOCK paid $775. Guard has a mark of 2:25¼, but in trials is said to have shown 2:15. Mr. POLLOCK also secured the bay stallion Germain, 2:15¾, by Mambrino King, dam Verdant, by Almont, Jr., paying for him $1,575. Many other lesser lights were also bought by Mr. POLLOCK and other foreign buyers. Altogether, Europeans purchased thirty-seven head, for a total of $18,950.

Mr. ROBERT BONNER, owner of Maud S., Sunol, and other noted performers, created quite a sensation by buying the crack Western trotter, Don L., 2:12½. The handsome and level-headed son of Colonel Tom was wanted by a number of turfmen and roadriders, but when they found Mr. BONNER'S agent in the field, gave up, and the game fellow was knocked down to the distinguished patron of the trotter for $1,650. When asked why he bought Don L., Mr. BONNER is said to have replied: "Because I want to ride faster than I ever have in my life." This coming from the man who has driven Maud S., 2:08¾; Sunol, 2.08¼; Dexter, 2:17¼; Rarus, 2:13¾, and many other flyers, is certainly high praise for Don L. Mr. A. A. BONNER, owner of the handsome stallion, King Rene, Jr., bought a two-year-old chestnut filly, by Nutwood, for $240.

A Canadian horseman, Mr. A. H. GILMORE, paid $2,300 for the great pacing mare Nelly McCrory, 2:11¾. This was the highest price paid during the sale. Marie Wellington, a promising green filly, consigned by Mr. EDWARD APPEL, of Rochester, N. Y., was purchased by Mr. JOHN MCGUIRE, of New York City, for $1,000. The filly is by General Wellington, a full brother of Mr. BONNER'S ex-queen of the turf, Sunol, 2:08¼. As the filly is said to have shown a 2:17¾ gait, and is eligible to the 3:00 class, she should be a good money winner this season.

Mr. E. H. HARRIMAN, proprietor of Arden Farms, the home of the great Stamboul, 2:07½, got a good bargain in the mare Livonne, by Gold Leaf—Minnie C, by Atlantic, for which he paid $675.—*The Rider and Driver.*

THE INVASION OF ENGLAND: SHOULD LONDON BE FORTIFIED?

The paper which I have the honor of reading to you this afternoon has been compiled with the object of calling your earnest attention to the danger our metropolis, in its present unprotected state, would necessarily be exposed to in the case of an invasion of this island, and to point out the means by which we could not only ensure the safety of London, but also reduce the probabilities and dangers of an invasion to a mere shadow.

For convenience of discussion, I have put the paper under five heads, viz:

I. A brief summary of invasions and attempts at invasion.

II. Are there indications pointing to an invasion of England as probable in the near future?

III. Is an invasion feasible, and what would be the invader's main object?

IV. What are our present means for warding off, or meeting, a hostile force, and can those means be considered as sufficient for that purpose?

V. If not so considered, what further steps should be taken?

I. SUCCESSFUL INVASIONS AND ATTEMPTS AT INVASION.

Up to the eleventh century this island was four times successfully invaded and conquered by the Romans, Saxons, Danes and Normans.

In 1580 the DUKE OF ALBA, the most able general of his age, and one who never lost a battle, elaborated a plan for the invasion of England by means of 600 ships and 60,000 troops. His death stayed the preparations, to be again, however, taken up, but on a more limited scale, in February, 1586. Owing to PHILIP'S refusal to permit the DUKE OF PARMA to capture Flushing, so as to obtain a safe and roomy harbor from which to embark the 31,000 men and 4,000 horses which the latter had collected at Dunkirk and Newport, the military expedition was never formed. The incapacity of Medina Sidonia, coupled with bad navigation, and the initial mistake of forming the Armada into one fleet only, proved fatal to success. DRAKE'S fireships and a storm did the rest.

On the 5th November, 1688, WILLIAM OF ORANGE arrived off Torbay with over 600 ships, and successfully disembarked 14,000 troops.

In 1690, LOUIS XIV. sent 10,000 troops to Ireland, and on the 10th July of that year the French Admiral TOURVILLE so completely defeated the combined English and Dutch fleets off Dieppe, that for the next nine months the French had the entire command of the Channel. But LOUIS, like NAPOLEON 115 years later, had his hands full on on the Upper Rhine and elsewhere, and allowed this favorable opportunity to pass.

In 1708, a feeble attempt was made by a French fleet of thirty-

two vessels from Dunkirk, but it was directed to the wrong point, and the French, meeting Admiral BYNG's ships, retired.

On the 26th December, 1796, General HOCHE sailed with an expeditionary force from Brest for Ireland, consisting of seventeen sail of the line and thirteen frigates, having 16,000 men on board. This force escaped the English blockading squadron, and although scattered by storms, arrived in Bantry Bay.

Here we have an instance of an invasion where the invader had not the command of the sea, but is blockaded and watched by a hostile fleet, and where the expedition fully demonstrated that England's shores had been for sixteen days at the mercy of an enemy, and this at a time when the naval power of Great Britain equaled, if it did not exceed, that of all the other nations put together.

On the 19th May, 1798, a French expedition sailed from Toulon for Egypt, with upwards of 36,000 men on board nearly 400 ships. This fleet was sighted by NELSON off Corsica on the 31st May, and pursued by him; and it is a very remarkable fact, as proving how easily hostile fleets, even of great magnitude, may pass each other at sea, that from the logs of these two fleets it would appear that on the night of the 22d June they were for several hours barely fifteen miles apart, having actually crossed each other's track. Here again, in spite of all our vigilance, the French succeeded in landing their troops undisturbed.

On the 1st March, 1801, Sir RALPH ABERCROMBIE arrived in Aboukir Bay with an expedition of 200 vessels, having 17,512 men of all arms on board, which, however, owing to bad weather, could not land until the 8th March. Meanwhile the French general brought 2,000 men and twelve guns down to the seashore, and these, supported by the guns of the works at Aboukir, opposed the landing of the English. The latter was effected in three divisions, 5,500 men being brought ashore at a time in 150 ships' boats.

Our Guards as they landed on the beach were actually charged by French cavalry, but the landing was successful. General BERTRAND says in his report: "In five or six minutes, 5,500 men were in order of battle on shore.

Here we have an instance were a landing is opposed, by an inferior force certainly, but supported by artillery firing into the boats crowded with men as they came on shore.

We next come to 1805. NAPOLEON's preparations for an attempt at invasion were, as regards scale, systematic preparation, and organization, such as will no doubt form the principle on which any future invasion, if any, will be based, especially his formation of two separate fleets, one of men-of-war left free for action, and the other for the transport of troops. He also adopted PARMA's idea of flat-bottomed boats of low draught and provided with oars and small guns. Forty-eight hours were then considered by the French naval authorities sufficient to carry across the channel, and land, 132,000 men and 400 guns.

In July, 1809, the WALCHEREN expedition, an army of 41,000

men, with two battering trains, sailed from England on the 28th July, and landed on the Continent on the 29th; that is to say, this English army was thrown on the shores of Belgium within forty-eight hours of embarkation—an instance proving how quickly troops can be carried across this narrow strait.

I would ask you: Is an invasion of England by a foreign army, looking at it from a military point of view, such a different and more difficult task than the landing of an army on the shores of a continental nation?

From this brief summary of actual and successful invasions we surely must admit that under no phase of the question can an expedition, such as the invasion of England, be taken out of the category of what has been tried, and succeeded. Although defensive power has increased since those days, so has offensive power in quite as great a degree, and an enterprise which our ruder forefathers performed, cannot, I venture to think, be deemed impossible by the present generation.

II. ARE THERE INDICATIONS POINTING TO AN INVASION OF ENGLAND IN THE NEAR FUTURE?

I beg to submit to you that this question must be answered in the affirmative. An invasion, although it has for years past been considered a remote and uncertain contingency, has of late years become more real, and has assumed a more definite aspect in a ratio corresponding to the increase of our colonial possessions and consequent responsibilities, and hence has become much more probable than is commonly credited.

As this subject is, unfortunately, little, if at all, studied by our commercial community, it has not attracted in this country that general attention which it deserves. As a proof that this view is shared by some leading politicians, I need only point to our papers and magazines, which of late have from time to time sounded a note of warning in this respect. It cannot be denied that this threatening danger, that is to say, hostilities, between England and a foreign power, or a coalition of foreign powers, is in a great measure due to our present and past good fortune in surmounting with ease the commercial, financial, and political difficulties which poison the life of so many of the European powers.

It is owing to her prosperity, in fact, that England has become an "unpopular" nation. You know you cannot grow and prosper above others without becoming the object of envy, and envy must fasten unpopularity on the object envied. We learn that fact almost daily from the perusal of foreign papers. Who that has read the French ones, for instance, of late, can deny it? They tell us very plainly, that although our soil is not half as rich as theirs, yet that we are far less hardly pressed by taxation. That, outside Europe, we have all the best pieces in the world, and hold them so easily and at so little cost to ourselves, that indirectly they bring us in a great deal; while on the other hand, their own colonies are

a constant drain on the mother country. That we have no conscription, while their life blood is drained by it. That all this, moreover, is simply ours by sheer good luck.

But, though in England there is absolutely no feeling of hostility against any particular nation, there is no use blinking the fact that most continental countries are deeply jealous of the power and prosperity of the British empire, and that the feelings of a great majority of foreigners are distinctly unfriendly to England. We can only regret this, we cannot alter it. As long as, for instance, France finds England her perpetual rival in all parts of the world—in the Mediterranean, in Egypt, Madagascar, Siam, the Niger territories, Newfoundland, and elsewhere—so long will Frenchmen look upon us with unfriendly feelings.

As regards Russia, she naturally considers us a power whose function it is to be at times, when our interests are concerned, stolidly and stubbornly tiresome and unamiable. Even Germany, while she agrees with us in many things considers us selfish, and finds us all over the world, a source of dislike and irritation; and so on with the other powers, great and small, they one and all show at times their envy of our prosperity as a nation.

Again, the fact of our vast and increasing commercial prosperity, which has made Great Britain the center of the world's commerce, and mistress of the greatest empire the world has ever seen; our success in the work of governing distant empires, of developing colonies; our easy solution of socialistic problems; and our stable, yet democratic, form of government, have one and all tended toward making us an "unpopular" nation.

I must further ask you to consider that Russia, France, Germany, and Italy, have one and all entered, with more or less success, the path of colonial enterprise; it is most probably due to this cause, that is to say, to mutual interests in various parts of the world, that the general European war, which has been expected for the last twenty-five years, has been staved off. But unfortunately, within recent years, the nations just referred to have gradually been drawing nearer and nearer to our spheres of interest in Asia and Africa; and I wish to put it to you, that however any foreign nation or nations may agitate or harass us to undermine our power there, the real decisive blow for our supremacy in either of those continents must, and can only, be struck, on a European battlefield, whether for good or evil.

Now, these points once admitted—and I do not think, judging by recent events, that we can very well shut our eyes to it—we must neither ignore nor forget them, because they become facts of the greatest importance, and a most distinct and unfavorable factor in all our dealings with foreign nations.

This is my apology for the statement I made at the beginning of this paper, viz: that there are indications pointing to the probability of an attempt at an invasion of England in the near

future, and that this danger is no longer a mere abstract theory, but an important political fact with which our government will have some some day to deal.

III. IS AN INVASION OF ENGLAND POSSIBLE, AND WHAT WOULD BE THE INVADER'S MAIN OBJECT?

I am fully aware that this subject of the possibility of an invasion is, in naval and military circles, a rather thorny one. Various opinions prevail. We have all experienced the fact how difficult it is to successfully combat the opinion of others. One may succeed sometimes in vanquishing people in a discussion, but never in fully convincing them. The fact is opinions are like nails: the more one hits them on the head the deeper one drives them in. Now, there are still in both services officers who persistently cling to the navy as being capable of alone defending this country against invasion. Some even refuse to entertain the idea of an invasion of England ever being attempted. Rather than contemplate the probable consequences of a successful invasion, they ridicule the idea of its probability, and stigmatize as panic-mongers all who regard the possibility of such a disaster. WELLINGTON himself was much alive to this possibility of an invasion, and if you look at the great wars in which our fathers and grandfathers fought on the continent of Europe, and enquire into the cause of it, you will find that English statesmen always waged war with allies, and deemed no sacrifice too great to keep war away from our shores. They saw clearly and knew too well that although the English fleets swept every sea, invasion even then was a possible enterprise; and leaving the channel to fulfill its legitimate functions, they wisely determined to fight their enemy on foreign, not English, soil, making use of their naval supremacy as a means of shifting the war elsewhere. Thus their army became the true means of destroying their enemy, and so defeating his intention of invading this country. In this respect you must consider that although a "successful" invasion of England would be the cause of a far greater disaster than the invasion of any other country in the world, yet, on the other hand, the "failure" of such an enterprise would entail a loss on the country attempting it of but a small portion of its military and naval strength. Thus were any power, or combination of powers, to attempt such an enterprise, the risk incurred by England would be far greater and the stakes at issue would be utterly disproportionate. You will see the force of this argument when you consider that England is densely peopled, very rich, that its inhabitants live chiefly by trade, commerce and manufactures, and that it does not produce food enough to feed its population. Hence the effects produced by the sudden diminution of the commerce of the country—caused directly by the invasion and indirectly by the enormous depreciation of all marketable stocks and securities—would be of the most fatal character, and would, indeed, be tantamount to placing a large population, now in easy circumstances, in a state bordering on starvation.

Although very much of what I bring before you this afternoon is by no means new, but has been said and written before, yet it is most desirable from time to time to verify the data on which the usually received ideas on the subject of an invasion are based, and to examine how far new discoveries—or what is much the same thing, new possible combinations of foreign powers—may have altered or modified those data.

It is still a moot question whether the adoption of steam and electricity will be more favorable in future wars to the attack or the defense in case of an invasion directed against our shores. Both will no doubt, to a certain extent, be benefited. But as the essence of the success of an attack in most cases depends upon surprise, and in all cases, on rapidity of action, it would appear certain that the assailant will derive more advantage from these improvements than those who have to resist his assault.

Now, you cannot get away from the fact that the invasion of these shores, like any other warlike enterprise, is a mere adaptation of means to ends. If the means exist, there can be nothing impossible in carrying it out. The means requisite for the invasion of this country consist in the power of assembling a force equal, or superior, to our existing land forces, embarking it, ferrying it over a sea ranging from twenty-five to two hundred miles wide in safety, and disembarking it on English shores.

Once disembarked there can be but little doubt that an army of say, 160 000 to 200,000 men, would most seriously jeopardize, not the independence (for permanent conquest would not, and could not, be the object), but the credit and confidence on which the commercial prosperity of this nation is based.

As to the possibilities of transport across the Channel, I wish to point out to you the facilities possessed by Continental nations nowadays, in their network of railways for collecting troops inland and rapidly despatching them, together with stores, etc., to one or more seaports for embarkation, and the enormous advantage which would accrue to France and Germany when embarking troops, horses and stores from the possession of the numerous steam tugs, and the hundreds of flat-bottomed iron and wooden barges on their canals and rivers, more especially so on the Rhine between Rhurort and Mannheim, and on the Lower Moselle. These tugs and boats, constructed for low water, have but a few feet draught, and can embark and disembark with comparative ease guns, horses and stores, and land their cargo at almost any state of the tide.

As to the ports of embarkation, the ports of 100 years ago still exist on the Continent to-day. The true base for the invasion of England is undoubtedly the mouth of the Scheldt, and you may rest assured that the neutrality of neither Belgium nor Holland would be respected in such a weighty problem as the invasion of England. In 1870 the neutrality of Luxemburg just escaped violation because the French were not prepared to send an army corps towards the Lower Moselle—a fact which did not, however, come to the knowl-

edge of the cabinet at Berlin until about the 24th July. So also may it be doubted whether McMahon would have respected the neutrality of Belgium, had he not been wounded at Sedan.

As to the means for transporting a large army, with its stores, etc., across the Channel! Of course, no nation has such means for rapidly collecting scores of transports as we have, but the immense facilities England possesses in this respect to-day gives one a very accurate idea, by comparison, as to what other nations may be able to do. For instance, those who have gone into this matter of sending military expeditions across the seas, will know that, without any undue strain on our merchant steamers in home ports, we could embark and send to sea 200,000 men in one single week, *i. e.*, within seven days. To those in doubt, or hazy on the subject, I would say, take a walk, as I recently did for the purpose of this paper, down to the London, Albert and West India docks. Note the ships, and their tonnage, at anchor, and with the aid of a few civil enquiries of the officials you will be surprised to find that, by utilizing the piers and jetties at Harwich, Sheerness, Queenborough, Chatham, Dover, Portsmouth, Southampton and Devonport, carrying to each port men, horses and stores by a different line of railway, fourteen transports can simultaneously be loaded with stores and filled with troops, thus enabling 40,000 men per diem to be embarked from the ports just mentioned, while leaving the port of London for embarkation of artillery, guns and ordnance stores from Woolwich.

I have shown you that in 1797 and 1798 two French expeditions carried 52,000 men between them. The French mercantile marine has trebled since then. But the great facilities European nations at present possess in transporting power is mainly due to the introduction of the large passenger steamers, etc. These vessels, built for passenger traffic, with enormous engine power, make a combined movement from various ports much more sure than the sailing vessels of ninety years ago. The French calculate for military expeditions to be carried a long distance, one man per ton of shipping. But for short journeys, like crossing the Channel, these regulations would be modified. For instance, forty-two steamers of the "North German Lloyd" class, could bring over three German army corps, complete in all details. The "Valmy," a vessel of 2,800 tons, carried 3,000 men to the Crimea, and a vessel of 2,700 tons brought 2,800 men home from Mexico, when that expedition returned to France.

We must also bear in mind that during hostilities an embargo would be laid on English ships in foreign harbors, many of which are largely manned by foreign seamen. In this respect, I may instance that the Emperor Paul, in 1800, seized 300 English ships in Russian ports alone, while in 1803, at the rupture of the peace, nearly 500 English ships were detained in various French harbors.

From this we may fairly conclude that the introduction of large steamers has rendered the transport of military expeditions an easier operation than it was in former days, and we also find that several Continental nations possess ample means for transporting their

troops to the coast, embarking them and carrying them across the Channel.

To effect the passage and landing of the troops in safety it would, of course, be imperative that the invader should obtain the temporary command of the Channel. In order to secure this, the invader will, you may be sure, profit by the lessons taught him by our forefathers in naval strategy. No one reading the account of the great naval actions which took place at the end of the last and the beginning of the present century, can fail to be struck with the fact that the English success was rarely due to superior force so much as to naval strategy, which enabled the English commanders to seize and keep an advantageous position, from which they could neutralize the enemy's superiority and apply their own force to the best advantage.

In the same way the invader, when attempting a passage of troops across the Channel, will endeavor to draw away our fleet and give battle to our ships at some point, or perhaps points, simultaneously, and distant from the spots selected for landing his troops. No nation would, for a moment, dream of counting the cost of a naval engagement for such a purpose. So also, it may seriously be doubted whether the fear of being cut off and severed from their base of operations will ever prove a deterrent to an invading force, when you consider the rich and tempting bait a successful invasion of England must be nowadays to many a Continental nation.

Ironclads, unfortunately for England, have somewhat diminished her powers of resisting invasion. Can harbors be now blockaded as they were in the beginning of this century? I venture to think not! The blockading force off any hostile port must be composed of steamers, and the mobile power of steamers is entirely limited to the amount of coal they carry, say a month's supply. We all know that there are almost insuperable difficulties to the coaling of vessels at sea, even in fine weather. Ironclads certainly possess more power as fighting ships than wooden vessels, but they are not so mobile, nor such good sea-going ships; and as in the case of an invasion our navy would be acting on the defensive, our ironclads would have to watch everywhere, to see from which direction the blow would come, as an invading force need not sail from one port only; a certain point, out of sight of land, could be fixed on the chart as the rendezvous for the hostile flotilla. History teaches us that fleets have been evaded and passed before now, or decoyed away as NELSON was. With ships numerous and uncertain elements and accidents also come into play, such as storms, torpedoes, ships running ashore, on rocks, into each other, and so on. Our own naval maneuvers prove these matters, and the passage of a fleet of thirty French war ships in 1882 through the Straits of Gibraltar undetected, that is to say, the fact of these ships having passed through the most carefully watched waters in the world (which are barely fifteen miles wide) unnoticed, furnishes a striking instance as to the ease with which fleets may evade or pass each other.

You must also not lose sight of the fact that although our navy is at present more powerful than that of any other nation, yet that

this superiority will disappear when we come to speculate upon a coalition of nations for the purpose of an invasion. Say, for the sake of argument, a combination of France and Russia, with probably Germany's silent consent, a coalition not at all so unlikely when you consider the peculiar political relations ever existing between Russia and Germany. Or another, and much more likely one, viz: the neutrality of the Triple Alliance and the isolation of England in case of an attack on the latter by France and Russia.

In either case our fleets in foreign waters and our troops abroad would have to remain at their respective stations, and then the French Channel and reserve fleets added to the Russian ships would be superior in numbers, if not in tonnage, to our own home fleets, as at the commencement of hostilities we should certainly not be able to put all our reserve ships into commission for temporary want of officers and seamen.

It must also be borne in mind that the new Kiel Canal considerably facilitates a rapid union of fleets in the North Sea or Channel, and that, provided the invader has his ships handy and watching, in the present day of steamers with a speed of fifteen to eighteen knots an hour, the hostile flotilla would venture across such a narrow strait in almost any, except the worst, sort of weather, and the least space of time gained, one day, even one night, would give the invader the start of us, and suffice for his landing.

Moreover, I would ask you, Is it quite impossible that a British fleet may meet with a temporary reverse? However remote the event, it should be provided for.

Hence I maintain that in these days of steam and electricity every thinking man must come to the conclusion that an invasion is even more possible than in the days of our ancestors, and if the arguments I have adduced are fairly considered I venture to think that you will agree with me when I state that, given certain prevailing circumstances, an invasion is a feasible contingency, that we are by no means impregnable, and further, that our fleet is a great protection without doubt, but that it does not, and cannot, *alone* give that perfect assurance against invasion which this country demands, but that our land forces and defenses also must be such as will enable us to look calmly on any attempt at an invasion of these islands. To those still in doubt I would like to say this: "How many a serious and difficult undertaking has not in all ages been considered impossible by contemporaries, until someone arose who, by sheer force of genius and will power, carried it through?"

AS REGARDS THE INVADER'S MAIN OBJECTIVE?

That, I beg to submit to you, can be but "the capture of London." There is undoubtedly at present a temptation existing in the defenseless state of London inviting the enemy to take advantage of some opportunity offered by the temporary absence of, or reverse to, our fleet, or of one of those extraordinary developments which every

student of military history knows is the real cause of sudden and unexpected success.

I would further impress upon you that no invader would ever commit himself to an invasion of England unless with a view to gaining possession of London, because no destruction of dockyards, arsenals, or any similar contingency, would ever be likely to induce England to capitulate and make terms any more than it is likely that an invader would plant himself permanently on the white cliff at Hastings or any other part of England. No! The occupation of London once accomplished, the conqueror's soldiers mounting guard over the bullion vaults at the Bank of England, with a Provost-Marshal at the Mansion House, and the Quartermaster-General in possession of the keys of our docks and warehouses, with parks of artillery in our principal squares, and London declared in a state of siege and under martial law, the British government would be powerless for anything but making terms with the invading foe. What government, I ask you, would dare to risk the loss of lives, the losses by destruction of property and ruin of trade, the misery, the crime and the saturnalia which any lengthy occupation by foreign troops would necessarily entail upon London and its six million inhabitants? Just imagine the evils inseparable from the presence of foreign soldiery, and the fact of our criminal classes finding themselves let loose. Hence I maintain that once London was seized, resistance in the country would be at an end, and a humiliating peace, accompanied by grinding war indemnities, would follow close on the news of the sudden invasion of England.

There can be no doubt but that the defeat of our army, and the subsequent seizure and occupation of London, must ever be the main objective of any hostile invasion.

Continental strategists, while admitting the serious and costly risk of an invasion, significantly put their finger on London and add: "Nothing venture, nothing win."

NAPOLEON, in 1805, when his attention was drawn to some reports stating that a number of British line-of-battle ships and frigates were cruising about the Channel and likely to harass or intercept the landing of the expedition on British soil, replied: "Well, suppose we lose 10,000 or 15,000 men while crossing; why, you lose a greater number than that in a single battle; and what battle, may I ask you, ever promised such results as the invasion of England and the capture of London?"

IV. WHAT ARE OUR PRESENT MEANS FOR WARDING OFF OR MEETING, AN INVADER'S ARMY, AND CAN THEY BE CONSIDERED AS SUFFICIENT FOR THE PURPOSE?

As I have already said, our fleet is our "first" line of defense, and is provided to prevent the sudden descent of a hostile force upon our shores. The fleet is the right thing for this duty, but may not always be in the right place, as I have endeavored to show.

Our "second" line consists of forts, and other defenses on various parts of our coast, for the protection of our dockyards and arsenals.

The "third," or innermost line of defense, is entrusted to our home army.

To show that there is a weak link in this chain, *i. e.*, our third line, and how this link may be strengthened so as to give real security, make London impregnable, and a successful invasion hopeless, is the purpose of this paper.

In the year 1874, I think, the late Colonel HOME, R. E., when on the staff of the Intelligence Department, prepared a scheme for forming our home army into eight army corps, which for home defense were to be concentrated in various parts of the United Kingdom. The scheme proved, however, too unwieldly, and was consequently abandoned. In 1886, when our present Commander-in-Chief, Field Marshal Lord WOLSELEY, was Adjutant-General to the forces, he created a branch at the War Office for the purpose of welding our scattered units into one army for the purpose of defense in case of an invasion, and the outcome of the deliberations of the staff officers occupied with that scheme I take to be the system for mobilizing our home forces as laid down in the official book published in November, 1894.

According to that scheme, the duty of meeting an invader's main army will devolve on three army corps and four cavalry brigades, the first and second army corps being composed entirely of regular troops, while the third will have militia battalions for its infantry portion. The four cavalry brigades will be made up of regular cavalry. Each army corps will consist of three divisions, and will number 32,519. The cavalry totals up to 10,755. Hence, we find that the "field" army numbers a total of 108,312 of all ranks. For a "reserve" line we then have the present existing twenty-two volunteer infantry field brigades, and thirty-two volunteer artillery (position and garrison) corps, to choose from. The mobilization scheme does not afford us any information in this respect, but I venture to think that we may take it that the intention would be to form some of these volunteer corps into army corps, to form a "reserve" to three army corps of regular and militia already mentioned, and that the duty of the former would be to move up in the places vacated by the latter, should they move forward from their original places of concentration. Taking the present strength and constitution of our volunteer force into calculation, they would give about 110,000 men, sufficient to form three "reserve" army corps.

The remainder of the militia and volunteers, say 180,000 men, would, with some line troops, we may presume, be allocated to form our garrison troops in Ireland, and to occupy our fortresses. The mobilization scheme, for obvious reasons, gives no data in this respect. In round numbers, then, we should have an army of 220,000 men to place in the field, and 180,000 to 200,000 men for Ire-

land and our garrisons and forts. This is, you will probably say, a not insignificant force, and at first sight one likely to make a possible invader hesitate before committing himself.

But I beg to submit to you that when you bear in mind the organization, composition, and training of our field army, and compare it with that of the hostile armies our troops may some day have to encounter, you will, I think, agree with me that our present "third line," intended for resisting an invasion, does not give that perfect security which we require, still keeping before us the unprotected state of London and its proximity to the coast.

I think I may venture to say that we are all agreed in considering the invasion of England a matter of such serious import, so important an undertaking, in fact, that it would be hopeless from its very inception, unless it were carried out by an army of considerable magnitude. I do not think that any nation would attempt it under any other conditions. RALEIGH justly says, "All petty attempts are more profitable to the invaded than to the invader." Hence it follows that we must be prepared to face the fact that, in the case of an invasion, our field army will probably have to meet and give battle to a hostile army of equal, if not of superior, strength to that of our own; and further—and this is a most important factor—that the adversary's troops will mainly, we may be sure, be composed of "highly-trained" troops, led by experienced and skilled officers.

Now, can we hope to oppose such troops with a similar number of "highly-trained" men? I fear not! We may succeed in placing 100,000 men of the regular army and army reserve in the field, all skilled men, but the remaining number required to make up another 120,000 men would of necessity have to be militia and volunteers.

I yield to none in my admiration of the splendid force we possess in our line troops, and I believe them to be a match for any army of whatever nation, number for number. But neither officers nor men of our auxiliary forces receive that individual training, that is to say, acquire that "painstaking mastery of details of the art of war," to which alone the term of "highly-trained" troops can be applied. Owing to the want of such "individual" training, they consequently lack the higher form of discipline. Whatever pluck, endurance, and intelligence may be possessed by officers and men of our auxiliary forces, yet they cannot, as at present trained and organized, with truth be considered in any way as a force fitted to match equal numbers of highly-trained troops on the field of battle, as modern tactics require the very highest training and discipline that a soldier can possibly have, seeing that they involve that which is most trying to the nerves of a soldier, viz: apparent isolation, disorder, confusion, and unflinching obedience. That the war of the future will bring a greater strain than ever on the nerves of those engaged, may be accepted as certain. Here I am speaking from personal experience, as I saw and felt the effects of these matters in the Danish War in 1864, and the Seven Weeks' War in 1866.

Need I quote you further instances of the second half of this century to confirm it? The American War of Secession is a brilliant example. Would that war have lasted six months if the North had at the outset possessed 150,000 trained troops? The Franco–German War, from November, 1870, to February, 1871, demonstrated that even when superior in numbers, partly-trained troops are not a match against highly-trained ones on an open battlefield. We also read in the narrative of the seige of Plevna, in 1877–78, that the want of training shown by the Cossacks caused serious difficulties on several occasions.

Before quitting this subject of the value of "trained," in comparison with "partly trained," troops, I ask your indulgence for a few remarks, as, having served in the ranks of an army raised by conscription, and in one raised by voluntary enlistment, I may be permitted to have some opinion on the matter.

A hundred years ago the armies of Europe were constituted more or less as the army of England is this day. But during the last sixty years war has become a science, and a very complicated one to boot. Hence, the continental powers saw the necessity of changing their military systems, in order to obtain the services of the whole talent and manhood of their respective nations for war, while England alone recruits her army as she formerly did. We are not concerned to-day in debating as to whether England, relatively to other powers, has lost or gained in not adopting conscription. But this I may be permitted to say, that the warlike strength of a country does not so much lie in the number of her guns, steamers, ironclads, torpedoes, railways, and so on, but rather in the skill and talents of the men who use these things; and further, that a nation whose army embraces all the manhood, skill, talent and knowledge in the country, must obviously possess more power both for offense and defense than a country where the army is recruited on the voluntary system, and consequently a thing apart from the nation. For you must bear in mind that in a country possessing a national military institution, whatever the nation has at heart, that the army seeks, because the whole intellect of such a country is more or less devoted to warlike pursuits. Hence, it follows that they are also superior in moral power to armies formed on the English model.

If you admit these arguments, then I maintain that we require special safeguards in order to extract the utmost value from our auxiliary forces under the present system, and I will now proceed to point the direction in which I venture to think such safeguards can be found.

There are, as we all know, comparatively few places on our coast where a hostile landing could be effected in great force, and on looking at these places on the map we also find that on almost every road leading from our coast to London there can be found certain points well adapted, if suitably occupied by our troops, for stopping the advance of a hostile force. The selection of such places is, of course, a confidential task, as it is our strategist's business to exercise that forethought in the establishment of positions, bases and

depôts, and the concentration of troops, whereby the greatest advantages are secured for the subsequent display of tactics in the presence of an enemy; hence, I need not go further into this matter. I should next mention that the whole of England is so enclosed and intersected by fences, woods, and enclosures of all sorts, and so thickly studded with villages and farm buildings, as to offer an immense advantage to an army on the defensive, and rendering it impossible for any large force to move across country, but confine it to an advance along the roads. Under certain circumstances arising, however, this advantage may cut both ways.

We may also, I think, take it that on an invasion becoming imminent, the working of all the railways would, by act of Parliament, be taken over by the Quartermaster-General. But, as an invasion of this country, as is generally agreed, I think, can be effected only by a *coup de main*, that is, suddenly, and as our coast line is our frontier, it would appear, curiously enough, that the effect produced by railways on the problem of an invasion is not so very favorable to us, as the point, or points, of concentration near the coast would appear to be too close to the spot, or spots, likely to be the actual scene of operations to render concentration by railway either a safe or practical operation. The true function of railways in modern war appears to be rather the rapid concentration of troops and material at some point, which becomes the base of operations, or the point of departure, and subsequent supply of an advancing army, and the removal to the rear of sick and wounded men. Hence, the point of such concentration must be well removed from any danger of attack, and should, and ought, most certainly be near some fortified place.

Lastly, the electric telegraph, while it undoubtedly adds to our defensive power in enabling us to get early and rapid information from various points on our coast, will now also allow descents to be made on different parts of our coast simultaneously, and will thus prevent the great advantage which hitherto has accrued to the defense of acting on interior lines in such a manner, as to allow different parts of an assailant force, attacking at intervals, to be overwhelmed by the superior force of the defender thrown judiciously on particular points, while only weak detachments are watching other points. For to resist an invasion under modern conditions of steam and electricity, the defender must be in force at, or within easy reach of, the point, or points, selected by the invader for landing; and strength at one point necessarily entails, where a long coast line and several points have to be watched, weakness at some other, and if he disseminates his force along the whole line, he becomes weak everywhere.

Now, we may rest assured that every point, favorable or otherwise to us, that I have enumerated just now, is perfectly well known to the military and naval strategists on the Continent, and that they give such points due consideration in their academical studies on the subject of an invasion of England. Hence, there can be but little doubt that the strategic movements of an invader will assume

a form something like this, viz: his object will be, while threatening various points, to throw the bulk of his forces on the decisive point, and so arrange the movements of his expeditionary force that even, although numerically weaker over the whole theater of war, he may be strongest when he attacks that point.

Therefore we must give due prominence to the fact that the invader, if he succeeds in landing his troops under cover of his ships' guns, will immediately endeavor, not only to break through the veil of our nearest outposts, but will also strain every nerve to push the latter rapidly back upon their main body, and further make such flank movements as are most likely to bring on a first battle as far removed from the coast and as near to London as possible.

Now, supposing the defender's force should at the outset meet with a reverse. In every attempt to deal with such an event one is immediately struck with the immense difficulties the commander of the defending force would, under present existing circumstances, experience when rallying his beaten troops, and endeavoring at the same time to safely and rapidly call up and concentrate reinforcements. The latter would be imperative, and an immediate necessity, in order to enable the defender to inflict a crushing blow upon the invader before the latter could reach the metropolis. But, in the absence of any protection around London, or even any *points d'appui* between that place and the coast, and in the near presence of the enemy, a safe and rapid concentration near an open city must necessarily become a task beset with great danger, and one requiring the gravest considerations. Because the calling up of such mixed reinforcements as our troops would then present would mean the setting in motion of large bodies of partly trained troops, unaccustomed to the work, destitute of organized transport, armed with weapons requiring ammunition of a pattern different to that of the regular forces, devoid of trained ammunition columns, and short of cavalry and field artillery; and these troops would be required to watch, stop, and checkmate highly trained troops, flushed with victory, and within striking distance of their goal, our Capital. Here, I maintain, is our weak point, the weakest link in our chain of national defense. When you reflect that the concentration of troops in the near presence of an enemy must ever be beset with difficulties, you will surely admit that in the case of a reverse to our troops, and in the absence of any permanent works between London and the coast, the problem of re-forming our field army near London, safely and rapidly, should be put beyond a doubt, for what we should then require is "time." A French author says truly, "*l'art défensif est de gagner du temps*," and time, we know, is the very essence of all war, and more especially modern war; and in order to gain time you must, of necessity, have some fortified place to retire to, in rear of which to carry out your object. This merely confirms the principle that "whenever a capital, by reason of its situation is distinctly likely to be the objective point of an invader, strong works round the capital become a necessity, between and

behind which the defending army, if worsted in a battle, might be reorganized."

Can we, therefore, fail to see the necessity of providing some such works in England, where, as I have endeavored to show, we are to a great extent dependent on "partly-trained" troops, which need such special safeguards in order to arrest the progress of a hostile army threatening the metropolis? Hence I maintain that our present system of national defense does not give sufficient security for a rapid and safe rallying of our troops after a reverse, nor does it provide for the unprotected state of London.

I ask you, who can and who will guarantee success to our mixed forces from the very beginning of the landing of a hostile foe? Have we always done the right thing, in the right way, and at the right time, in our wars? I think not. Can we consider ourselves outside possible accidents and strokes of ill luck? Are we to wait until misfortune overtakes us, and then put our house in order, as other nations have had to do before now, and to their cost? Surely not! When you please come to consider that London is truly and essentially not only the capital of this country, but also the very center of the political, commercial and social life of the nation, you will surely grant that it behooves its rulers to make "assurance doubly sure" by adopting such measures for the protection of the metropolis as will in all likelihood prevent any danger to it ever arising.

V. WHAT FURTHER STEPS SHOULD BE TAKEN TO ENSURE THE SAFETY OF THE METROPOLIS?

Si vis pacem, para bellum, and how true this is to-day with regard to England's political relations with foreign powers!

You will ask what steps I propose should be taken to minimize, stave off, or prevent an invasion. My reply is, "A chain of large 'permanent works,' connected by smaller 'field' works, around London, so that it should be no longer the heart of the country without a breast-plate." You will agree that our fortifications at Devonport, Plymouth, and at other points are important only for the protection of our dockyards and arsenals, and as *points d'affaires* for our navy, but they are certainly not in any sense a protection for our metropolis, which must be of paramount importance in any scheme of national defense.

I am sure you will also admit that there is not anything new in a proposed fortification of London; but rather is it a proposition which has twice during the present century most seriously agitated the government of this country.

As early as 1803, when a French invasion appeared imminent, a long and interesting debate took place in the House of Commons upon the question as to whether London should be fortified. Mr. PITT strongly enforced the propriety of strengthening the metropolis, and ended his speech by saying: "It is in vain to say that you

should not fortify London because our ancestors did not do so, unless you can show that they were in the same situation that we are. * * * If the fortification of the capital can add to the security of the country I think it ought to be done. If by the erection of earthworks, such as I am recommending, you can delay the progress of the enemy for three days, it may make the difference between the safety and the destruction of the capital."

Again, in 1860, when the Royal Commissioners, appointed on 26th August, 1859, to enquire into the national defenses, sent in their report, they recorded therein their opinion, and this notwithstanding the fact that the fortification of the metropolis was not included in the scope of the enquiries to be set on foot by the Commissioners, that "in addition to the twelve millions recommended for certain works, they were of opinion that further works would be necessary for the defense of the metropolis, for shielding the heart of the empire against attack."

Portsmouth and Plymouth have been fortified, but nothing has been done for London; our metropolis is still in its present unprotected state. Now, I beg leave to say that if we adopt fortifications for some vital points, such as dockyards, surely we ought not, and must not, leave the most vital of all—the metropolis, the occupation of which must decide a campaign—unprotected and unfortified. A high military authority, Baron MAURICE, has written: "The capital is the center of the national life, and it must not be left to the risk of a sudden, bold attack. If Vienna, in 1805; Berlin, in 1806; Madrid, in 1808, had been fortified, the results of Ulm, Jena, and Burgos—would have been different. If Paris, in 1814–15, had possessed a citadel capable of holding out only for eight days, the destinies of the world would have been changed."

MONTHOLON, in his book on NAPOLEON I., quotes the following opinion, as expressed by the Emperor: "He had frequently turned in his mind the propriety of fortifying Paris, as he thought it the greatest of all contradictions to leave a point of such importance as the capital of a country without the means of immediate defense. Let not the English imagine that their naval superiority renders these observations inapplicable to their capital. Who will guarantee the navy of England in all future times against a maritime disaster, and against a rout of Leipzig at, or near, the mouth of the Thames?"

Since this was spoken Paris has been fortified, and its fortifications proved of such great value in the winter of 1870–71, that the perimeter of the works has been doubled since. Are we the only people whose rulers will not profit even by experience? Are our military authorities so sure that our "army in the field" will, under all circumstances and possible conditions, suffice to insure the safety of the capital? I do not think for a moment that any government now shut their eyes to the danger of the metropolis being unprotected, but I also have no doubt that the remoteness and uncertainty of the possible peril, combined with a prudent desire to avoid the danger of creating a panic, by implying a doubt of the

durability of peace, or by creating a distrust in the capabilities of our military forces to cope with any foe in the field, may induce even a vigilant executive to postpone precautions until too late to adopt them with due effect.

It is for these reasons that I would at the present moment urge the propriety of surrounding London by a chain of works on the so-called polygonal system, the simplicity of which gives it the advantage of being more readily adapted to irregular ground. These works, occupying some fifty acres of ground, would contain sufficient storage, in addition to their own requirements, to hold mobilization stores and entrenching tools, as well as guns, stores, and ammunition for the smaller works, to be subsequently erected between the larger ones. These smaller works, on an average of say six acres of ground, might be made in the form of earth-works, or "redoubts," of as large a section or "profile" as time would permit, or they might be a kind of compromise between field and permanent works, what the sappers term "provisional" works.

These latter, two or three between the large ones, need not be constructed beforehand; it would only be necessary to secure the ground required for that purpose. Our troops could easily construct these secondary works when invasion is known to be imminent. Some works of this kind were constructed in 1866, just before the war, around Florisdorf, on the north side of the Danube, for the protection of Vienna, 7,000 men being employed. A little later in 1866, when war had broken out and the Prussians had occupied Dresden, several small detached works were built round Dresden by about 6,000 men in a fortnight. London and the surrounding country lends itself admirably for such a purpose. Once the larger works are finished, an invasion by a foreign power would become problematical, as a hostile force could not invest or starve London, its communications with its base would be far too insecure, as any reverses to our fleet would and could be but temporary. These works would prove of incalculable value to our auxiliary forces and enable them to become of much greater value than they are at present. The fortification of London is the very supplement to our volunteer movement. The very *raison d'être* of the volunteer force is the fear of an invasion. If we can boast that we possess a great deal of the talent and intelligence of the younger portion of our manhood in its ranks, surely we ought not to neglect the means so to our hands of turning that talent and intelligence to the best and most profitable account. In the execution of these works, both militia and volunteers could be employed, thus forming an excellent school of instruction in the use of the spade, and making the men thoroughly *au fait* with the task they may have one day to perform, and familiar with the works they may be called upon to perform.

Having thus surrounded London in a perimeter of some eighty miles by a cordon of earthworks, showing an armed front in every direction, you would have the termini and rolling stock of the principal railways within that circle; hence, every facility to transport

troops from and to all parts of the country. You would also have the power of calling a peremptory "halt" to any hostile foe threatening the metropolis. The boundary of these works would hold our field army, and thus become an "entrenched" camp, giving a secure starting point for operations against the enemy's field armies, and afford shelter to our own if worsted in the field.

As to the cost of such works as I propose here, I may say at once that we must look upon such an undertaking in the same spirit in which a man insures his house against fire, viz: as a premium paid by the nation to assure it against an invasion, and the capital against capture.

In this rough sketch here I have marked sixteen points for large permanent works, to show you the perimeter and also the distances between the large works. The latter would be distant some twelve to eighteen miles from the General Postoffice, and the distance between these works would vary from four and one-half to eight and one-half miles, according to the nature of the ground. The points I have marked are, commencing in the northeast:

1.	Waltham Abbey.	9.	Flint Hill.
2.	Abridge.	10.	Merstham.
3.	Romford.	11.	Boxhill.
4.	Rainham.	12.	Esher.
5.	Dartford.	13.	Kempton.
6.	Farningham.	14.	Hounslow.
7.	Steer Hill.	15.	Harrow.
8.	Hogborough Hill.	16.	Wrotham Park.

The purchase of the ground, under Act of Parliament, for the erection of the works, say, 800 acres, at an average of £420 an acre, would be	£ 336,000
For construction of sixteen works, at, say, £320,000 per work	5,120,000
A total of	£5,456,000

Of course I do not by any means pretend to this being an accurate estimate, or to the points marked being those most suitable, as so much must depend on the type of works selected for erection, and the perimeter around London considered the safest and most suitable. Then there is the armament of the large and small works to be considered as items of first cost.

But even so, when you consider that something like twelve millions were expended for the protection of our dockyards, and when you come to reflect on the effect such works as the above would necessarily produce on the minds of continental strategists when speculating on an invasion of England, you will agree that even ten millions would be a cheap premium to pay.

Gentlemen, I have done, and I must ask you to accept my deepest apologies for having asked your attention for such a length of time; but I am sure that you will agree with me when I say that

the subject I have spoken on is a weighty one, and worthy of your best reflection.

Whatever may be the future, and whenever invasion may come, we hope, as we believe, that British officers and men will ever uphold the honor of the country, and that they will prove themselves equal to the calls which may be made on their skill, on their valor and their endurance.— *Captain W. H. Harrison, Quartermaster First London Volunteer Artillery, in Journal of the Royal United Service Institution.*

THE CAVALRY HORSE.

B. Pollock & Co., of Vienna, cabled a day or two ago to Gil Curry, the young Kentucky trotting-horse driver, who has been acting as a buyer of trotting stock for several Austrian dealers, asking whether he could supply 2,000 cavalry horses for use in the army of Greece. Curry immediately took a steamer for Vienna, to consult with his correspondent. The troubles in Canea and Cuba, together with the wonderful taste for cavalry sports developed among the young men of America, as for example our own splendid "Squadron A" and "Troop C," make it timely to comment upon the cavalry arm of warfare. The Austrian cavalry is looked upon by many authorities as the finest in the world, and after the Hungarian cavalry maneuvers, not a long while ago, some very interesting points were brought to light in a letter to the London *Times.* These will prove not only valuable to our National Guard troopers and our amateur organizations in civic life, but should also become useful to the United States army authorities. The fundamental principle evolved was that "a good cavalryman on a bad horse is of no more use than a good infantry shot armed with an indifferent rifle." This once grasped, it becomes self-evident that the first necessity to improve the mounted arms is to raise the breed and increase the number of suitable horses throughout a country until the desired standard be attained.

On the continent this matter is now receiving well-deserved attention. The breeding of army horses is being enormously developed, with more or less successful results. In no country, however, has the question been so carefully studied as in Austria, where the government has, through a wise system of encouragement afforded to the farmer, converted the vast open plains of central and southern Hungary into the breeding-grounds of the best cavalry horses in the world. A visit to these parts soon convinces one of this. The most striking thing to the horse-loving traveler is the number of well-bred, well-shaped horses seen, and the dearth of coarse, hairy-heeled ones. Good animals, mostly of the stamp of smart, medium-weight hunters, abound everywhere. They are met with grazing in droves across the open plains, or trotting briskly along, generally in pairs, drawing the light wooden-framed farm wagon of the country, followed, as a rule, by a foal or yearling.

The young stock thus accompany the dam, feeding by the roadside, then trotting or galloping along to catch up the parent, becoming active and hardy, and at the same time docile and tractable, through the frequent visits made in this manner to the neighboring villages or towns.

There are nine large studs in Hungary, adds the *Times*, besides two large and six smaller ones in Austria. These are under the Agricultural Department, but have been managed since 1866 entirely by military stud corps. They were formed by the Emperor Joseph II. "to raise the breed of horses and to improve the mounting of the army." At these establishments a certain number of horses are bred, and thoroughbred stallions, many of them English, are maintained and sent around the country to different centers, for the service of farmers' mares, at nominal fees. The government has first call on the produce, which is purchased direct from the breeder at from five years old—exceptionally at four and-a-half—up to seven, at prices varying annually, but fixed for 1895 at between £16 and £32, so that the average may not exceed £25 on allotment to corps after all expenses have been defrayed. There are, besides these studs, three remount depots, where horses found to be exceptionally good, and bought, consequently, at three and-a-half, are kept while maturing. The average price sanctioned for artillery draught horses in 1895 was £28. The purchases are made by standing committees, of which there are at present six, at central places in Hungary. Regiments may purchase horses direct, if of a very superior class. Twelve per cent. of riding and ten per cent. of draught horses may be cast off annually, so that practically no cavalry horse serves more than eight years in the ranks or is over thirteen years of age. At the prices stated above, the Hungarian cavalry horse is far superior to the average animal of the same arm in England. The reasons, stated briefly, for this are the great care bestowed on horse-breeding by the government in Hungary, the assistance given through the cheap service of thoroughbred government stallions, the claim thereby established of first call on produce, and the purchase direct without the expensive intervention of the middle-man. All old and useless horses being eliminated through the weeding out of twelve per cent. annually, only thoroughly sound, serviceable animals remain in the ranks. They average 15.1½ or 15.2 in height.

It cannot be objected that the points mentioned above are inapplicable to our chief horse-breeding country, Ireland, concludes the *Times*. The system has only to be vigorously adopted for it to prove its own success within three or four years. The one thing necessary is the initial sum required to start a couple of remount depots and to purchase the requisite number of stallions. The latter would pay for themselves; the former would, with the other matters mentioned, economize a large proportion of the present remount expenses, and within five years the breed of Irish horses, of the trooper class, now rapidly degenerating in quality and diminishing in number, would be materially improved.—*The Rider and Driver, March 13.*

TO MOBILIZE THE MILITIA.

OMAHA, March, 1897.—A man in this city, who has had considerable experience in militia matters, has made a suggestion regarding the mobilization of the militia of the United States in connection with the Trans-Mississippi Exposition, worthy of serious consideration. In brief, this plan contemplates the assembling of the militia of the several States of the Union in one grand school of instruction, such as has not been afforded the State troops since the late unpleasantness. This idea in itself is not a new one, the same plan having formed the subject of many discussions in gatherings of military men and having been exploited in magazine articles by military writers; but the opportunity offered by the exposition presents an occasion more favorable for the practical execution of the plan than has occurred since the idea was first advanced.

It is well known to all who are familiar with military matters that each State of the Union has a force of soldiers organized and armed under the direction of the State. These State troops hold encampments each year, or once in two years, the State paying the expenses in connection with such encampments. The plan under consideration involves the massing of these troops in the vicinity of Omaha during the summer of 1898, for the purpose of holding a school of instruction affording the opportunity of actual experience in maneuver and the movements of large bodies of troops. The magnitude of this plan is not apparent to the layman at first glance; but when it is considered that the uniformed citizen soldiery of the States of the Union number nearly 150,000, the idea grows until it assumes enormous proportions. The idea also includes the assembling of several regiments of United States troops of all arms, including infantry, cavalry, light and heavy artillery and engineer corps. In a word, it would mean the assembling at Omaha of an army of no mean proportions, and would be one of the grandest military events in the history of this country.

It is believed that every State in the Union could be depended upon to send its troops to this encampment for the sake of the advantage to be derived from such an experience. The expense involved would be little, if any, more than the usual expense attached to the regular State encampments, and the superior advantages offered by a summer campaign approaching as nearly as may be the experiences of actual warfare would be of incalculable value to all the troops.

The plan suggested contemplates having the entire affair under the direction of officers of the regular army. To do this it would be necessary to secure the coöperation of the Secretary of War, but as several former Secretaries of War have advocated very warmly the idea of fostering the State militia in order to form a well-drilled and experienced nucleus around which might be thrown the 9,000,000 of able-bodied citizens of this great republic who are available for military duty, it is not anticipated that there

would be any difficulty in securing the active and hearty coöperation of the government in such a movement. — *The Exposition Press Bureau, Omaha.*

REORGANIZATION OF THE BRITISH CAVALRY.

As explained by Mr. BRODRICK in the House of Commons, the reorganization of the British cavalry of the line will effect various changes.

There will still be four corps, namely, the Household cavalry, of three regiments, which is not to be changed at all; the dragoons, ten regiments; the lancers, six regiments; the hussars, twelve regiments.

The first and largest establishment will be that of the nine regiments in India; next come the eight at home, ready for service abroad; then three regiments in the colonies, and so on. According to the London *Standard*, each cavalry regiment will, under the new system, consist, as now, of 630 officers and men and 525 horses, but the total number of officers will be reduced by two, *i. e.*, one captain and one lieutenant, leaving one lieutenant-colonel, four majors, five captains, nine lieutenants and seven second lieutenants, in addition to the regimental staff officers. The three regiments abroad at stations other than in India (*i. e.*, South Africa and Egypt) will also have no change in their total numbers of men of all ranks and horses (497 and 360 respectively), and they will be the only line regiments to retain exactly their present establishment of officers, viz: one lieutenant-colonel, three majors, six captains, eight lieutenants and three second lieutenants. Each of the eight regiments on the higher establishment at home will have their total numbers reduced from 696 to 682, but the number of horses will be increased from 410 to 433. There will also be an increase in the number of officers, the majors being augmented by one, the captains reduced by two, and the second lieutenants augmented by three, making one lieutenant-colonel, four majors, four captains, eight lieutenants and six second lieutenants. These eight regiments will probably include the Sixth Dragoon Guards, First Dragoons, Second Dragoons, Third Hussars, Tenth Hussars, Thirteenth Hussars, Fourteenth Hussars and Fifteenth Hussars.

Each of the seven regiments on the lower establishment at home will be increased from 450 of all ranks and 280 horses, to 578 of all ranks and 343 horses.

BOOK NOTICES AND EXCHANGES.

ROOT'S MILITARY TOPOGRAPHY AND SKETCHING. Revised and enlarged by Captain W. D. Beach, Third Cavalry; Captain A. G. Hammond, Eighth Cavalry; First Lieutenant C. H. Muir, Second Infantry; and First Lieutenant T. H. Slavens, Fourth Cavalry. Hudson-Kimberly Publishing Company, Kansas City, Mo.

The book contains 379 pages, and is divided into two parts, Part I being Topographical Surveying, and Part II Topographical Sketching. The typographical work is admirable, and the 216 illustrations are excellent. The index is full and complete.

The various subjects are presented in the clearest manner possible, and are so divided and subdivided as to make their understanding very simple.

Part II, which is of great importance to all army officers, contains much that is presented in a new way, and the authors of the revision deserve great credit for the arrangement and clear manner of this portion of the book. The colored plates will be of great assistance to all students of topography.

The book covers fully and concisely the subjects required in the examination of officers for promotion. Part II and a part of Chapters III and XI contain all the matter that hitherto had to be found by going entirely through "Richards' Topography."

The service has long felt the need of a work on topography in which the subjects were treated according to American ideas. This need is now fully supplied. E. L. P.

THE DICKMAN FIELD HOLDER. Lieutenant J. T. Dickman, Third Cavalry. Hudson-Kimberly Publishing Company, Kansas City, Mo.

The holder consists of two stiff covers $5\frac{1}{2}$x8 inches, enclosing a pad of blank forms with appropriate headings, for use by commanders of patrols or larger bodies of troops in the field in making the usual reports and communications. One side of each blank is ruled with half inch squares for use in making a hasty road or outpost

sketch. An ingenious method of folding a detached sheet is devised so as to obviate the necessity for an envelope. There is a pocket and pencil holder on the inside of the cover.

The device as stated in the instructions, "is intended to be used in a course of instruction of the company or troop in field duties; later, in connection with tactical exercises of the battalion or squadron and of larger mixed bodies; and eventually in actual service in the field in time of peace or war."

The "Field Holder" should prove a valuable aid in the instruction of non-commissioned officers as well as a useful addition to the contents of every cavalry officer's saddle-bags. W. D. B.

CONVERSATIONS ON CAVALRY. Kraft Prinz zu Hohenlohe-Ingelfingen. Translated by Lieutenant C. Reichmann, U. S. A. Edited by Captain F. N. Maude. J. J. Keliher & Co., 33 King William Street, E. C.

The conversations are those recently published in the JOURNAL and present, in book form, the very excellent matter contained therein.

In his letter Captain Maude says: "My work as editor has been very slight, merely amounting to bringing the various technical terms used in the original into accordance with our own regulation expressions. Our Inspector-General of Cavalry is delighted with the book and joins me in expressing our gratitude to you for your kindness in allowing us to make use of your work."

The correctness of the principles laid down in these conversations is too well known to need any comment.

In his preface Captain Maude expresses his thanks to Lieutenant Reichmann and the JOURNAL, and concludes by saying: "I trust my readers will see in this courteous act a fresh evidence of the kindly spirit of comradeship in arms, which has always existed, and I hope ever will continue to unite the officers of both armies, and which is so well expressed in Admiral Tatnall's memorable saying, 'Blood is thicker than water.'"

The book should be in the library of every cavalryman.

A. G. H.

CAVALRY VERSUS INFANTRY. By Captain F. N. Maude, R. E. No. 4 of International Series. Published by Hudson-Kimberly Publishing Company, Kansas City, Mo.

The revised contents of this volume include many of the very best essays of that most versatile writer and profound military student, Captain Maude. This is the most readable collection that could well be assembled in one volume, and will be much appreciated by cavalry readers, a large part of the work being devoted to that arm of the service.

Captain Maude is a rare student, and is seldom carried away by

specious arguments, relying rather upon historical examples in the past than problematic prognostications as to the future, based only upon theory. In this connection he says in the essay, entitled "The Napoleonic Conscription":

"No matter what perfection the armament attains to, its ultimate power on the battlefield depends on the nerves and courage of the men to whom it is entrusted. Artillery has, relatively speaking, no nerves, for the gun and the ground never shake, and besides the detachments are, so to speak, anchored to the ground. The greater the torrent of projectiles poured out, the greater becomes the necessity for speed in the advance, and that speed will always be found in the cavalry, which arm also has the advantage, thanks to its superior mobility, of being kept out of fire till wanted, and then appearing with its morale not only unshaken, but positively intensified by the rapid motion of the charge.

"No matter what pitch of perfection fire-arms attain, these two fundamental advantages will remain on the side of the cavalry and artillery, and though we never expect to see again on any European battlefields soldiers so entirely demoralized *ab initio* as were the latter-day soldiers of the Empire; still the more the volume of modern fire is increased, and the greater the distances it sweeps, the more certain does it become that eventually such a state of moral collapse will set in, and the only way to guard against its effects on one's own side, or to draw advantage from them on that of the enemy, will be by assigning larger duties to the cavalry and artillery, and making the most of the above mentioned two fundamental advantages they possess. I do not wish to be understood to be desirous of exalting any one arm at the expense of the other, but I claim an equal right for all. An army forms a trinity in which none is before or after the other, none is greater or less than the other; and the country whose leaders are the first to recognize this great truth will be as invincible on land as Napoleon was till he met a leader backed by better men who understood this fundamental truth even better than he did himself."

These remarks are hardly in accord with the ideas of many officers, especially of the infantry, who believe that nothing can live within fifteen hundred or two thousand yards of an infantry line with modern magazine guns. Arbitration and the two thousand yard limit may settle some international troubles, but wars similar to the American Revolution or the late Rebellion, or in fact any war in which the hearts of the people are aroused, can never be concluded without a closing struggle in which courage, manhood, and the determination to uphold principle, will cause armed hosts to advance and settle in desperate battle the relative power and courage of the opponents.

It may certainly be accepted as an axiom, that no American general would presume to announce his defeat, or attempt to surrender his men, because of any fear of the much talked of "fire-swept zone," or whatever term may be used to describe the fearful mortality to be brought about by modern arms. If naval officers wrote and talked as much about the frightful risks of battle in our modern iron-clads as army officers do about those incident to smokeless powder, flat trajectories and magazine arms, no seamen could be enlisted to man our fleets. According to infantry teachings no cavalry can be used on the future battlefield, and artillery will not be allowed to unlimber within two thousand yards. Theorists seldom see any solution of battle problems except for the defensive, yet history teaches quite the reverse, and we may well believe that

in the future, as in the past, the three arms will find appropriate work on and near every battlefield where any vital question is settled. Pride in one's arm of the service is laudable, but to exalt it at the expense of historical truth and the feelings of brother officers of other arms, is neither praiseworthy nor evidence of knowledge and good judgment.

These remarks were suggested by certain parts of the essays touching upon the subject, but there are other essays of an entirely different nature of more than passing interest. The Berlin-Vienna race, and General von Rosenberg's hints on training and riding are very interesting as well as instructive; in fact, the whole volume may be taken as a fine example of essay writing, in which our officers are expected to be experts during the progress of the annual lyceum work. W. H. C.

JOURNAL OF THE UNITED STATES ARTILLERY. January–February, 1897.

1. An Experiment With Militia in Heavy Artillery Work. 2. Notes on European Seacoast Fortifications. 3. Report on Development of a Photo Retardograph. 4. An Alternating Current Range and Position Finder. 5. On the Rifling of Cannon. 6. The Mounting of 8-inch B. L. Rifles at Fort Wadsworth, New York Harbor. 7. Professional Notes. 8. Book Notices. 9. Index to Current Artillery Literature.

PENNSYLVANIA MAGAZINE OF HISTORY AND BIOGRAPHY. January, 1897.

1. The Blue Anchor Tavern. 2. The Family of William Penn. 3. Extracts from the Letter-Books of Lieutenant Enos Reeves, of the Pennsylvania Line. 4. Washington After the Revolution, 1784–1789. 5. Diary of Lieutenant Francis Nichols. 6. The Battle of Princeton. 7. The Defenses of Philadelphia in 1777. 8. Some Account of the Second Troop of Philadelphia Horse.

PROCEEDINGS OF THE UNITED STATES NAVAL INSTITUTE. No. 4. 1896.

1. The Right of Search and its Limitation in Time of Peace. 2. The Chronology and Geographical Distribution of Icebergs in the Southern and Antarctic Oceans. 3. Target Practice at Sea. 4. Naphtha Fuel for War-Ships. 5. Development of Ordnance and Armor in the Immediate Past and Future. 6. Armor and Heavy Ordnance. 7. Professional Notes. 8. Book Notices. 9. Bibliographic Notes.

THE MAINE BUGLE. January, 1897.

1. The Vicksburg Campaign. 2. A Maine Boy in the Fifth Ohio Cavalry. 3. Adventure at Farmville, Virginia. 4. Adventures in a Rebel Prison in Texas. 5. Our Brothers in Blue. 6. An Incident of Central Guard House. 7. History of the Eleventh Maine. 8. Union Veterans Reunion. 9. The Color Bearer. 10. Reminiscences of the War. 11. Bugle Call.

JOURNAL OF THE ROYAL UNITED SERVICE INSTITUTION. February, 1897.

1. Major-General Robert Ross. 2. On the Employment of Retired Blue Jackets, Soldiers and Marines. 3. The Invasion of England; Should London be Fortified? 4. Notes on Tactics for Ships and Weapons of the Present Day. 5. Naval Notes. 6. Military Notes.

JOURNAL OF THE MILITARY SERVICE INSTITUTION. March, 1897.

1. The Lyceum at Fort Agawam. 2. Land Mines. 3. Army Uniform. 4. Battle Tactics and Mounted Infantry. 5. Artillery Firing Charts. 6. The Field Outfit for an Infantryman. 7. Reprints and Translations. 8. Military Notes. 9. Comment and Criticism. 10. Reviews and Exchanges. 11. Annual Report.

THE UNITED SERVICE. January, 1897.

1. Society in Washington. 2. Balls Bluff. 3. Rear Admiral James Edward Jouett, United States Navy. 4. Some Experiences With the Cheyennes. 5. The World Beneath the Ocean. 6. Service Salad.

JOURNAL OF THE UNITED SERVICE INSTITUTION OF INDIA. January, 1897.

1. Military Railways in War. 2. Partisan Operations. 3. Cavalry Field Hospitals. 4. The Improvement of the Present Organization of Transport in India. 5. Occasional Papers.

PROCEEDINGS OF THE ROYAL ARTILLERY INSTITUTION. February, 1897.

1. A Two Month's Trip into Mongolia. 2. Artillery Positions and Screening guns. 3. Formula for Finding Speed of Objective.

ALDERSHOT MILITARY SOCIETY. December, 1896. Campaign of the Pyrenees, 1813.

REVUE DU CERCLE MILITAIRE.

IOWA HISTORICAL RECORD.

MILITAER WOCHENBLATT.

THE BREEDERS' GAZETTE.

THE RIDER AND DRIVER.

OUR DUMB ANIMALS.

Annual Meeting of the Cavalry Association.

The regular annual meeting of the Cavalry Association was held at Fort Leavenworth, Kansas, January 22, 1897, with Major A. R. CHAFFEE, Ninth Cavalry, in the chair.

The annual election resulted in the choice of the following officers for the ensuing year:

President—General WESLEY MERRITT Major-General, U. S. A.

Vice-President—Major A. R. CHAFFEE, Ninth Cavalry.

Members of the Executive Council—Captain W. H. CARTER, Sixth Cavalry; Captain W. D. BEACH, Third Cavalry; Captain E. SWIFT, Fifth Cavalry; Captain A. G. HAMMOND, Eighth Cavalry; Lieutenant A. L. MILLS, First Cavalry.

The question of offering prizes for meritorious articles to be published in the JOURNAL was discussed at some length, and met with almost universal approval; it was therefore

Resolved, That the Secretary be directed to take the steps necessary to cause the Constitution to be so amended as to remove the present limit upon the amount of the prize that may be awarded for essays, and to place the matters pertaining to prize essays entirely in the hands of the Executive Council, with unlimited discretionary powers.

The report of the Treasurer was then read and approved.

By a unanimous vote of the Association the following motion was adopted:

Resolved, That the thanks of the Cavalry Association be hereby extended to Captain W. H. CARTER for his able and efficient management of the JOURNAL during the past year.

The meeting then adjourned *sine die*.

The subsequent promotion of Captain W. H. CARTER to be Major and Assistant Adjutant-General, and the detail of Captain E. SWIFT to duty with the National Guard of the State of Illinois, removed two of the recently elected members of the Executive Council, and also left the Editor's chair vacant. A special meeting of the Council was accordingly called to meet March 4th to fill these vacancies, and to consider such other matters of importance as might be brought before it. The vacancies in the Council were filled by the election of Lieutenant J. A. COLE, Sixth Cavalry, and Lieutenant T. H. SLAVENS, Fourth Cavalry. Lieutenant SLAVENS was duly appointed to the vacant editorship of the CAVALRY JOURNAL.

The subject for a prize essay and the details of the competition were then discussed, but the Council finally adjourned to meet again on the 8th, when definite action was to be taken concerning this matter. The plan as finally adopted is published in a separate announcement elsewhere in this number of the JOURNAL.

E. L. PHILLIPS,
Second Lieutenant Sixth Cavalry,
Secretary.

PRIZE ESSAY.

I.

At a special meeting of the Executive Council of the Cavalry Association, held March 8th, to consider the subject of a prize essay, the following resolution was adopted:

Resolved, That the Cavalry Association undertake the production of a history of the American cavalry, which shall be brought out in the form of a series of historical essays, to be published in the JOURNAL; to this end be it further

Resolved, That the Cavalry Association does hereby offer a prize of $100.00 in cash for the first essay of the series.

The prize will be awarded under the following conditions:

1. The competition to be open to all persons.

2. The essays must not exceed 30,000 words.

3. Three typewritten copies of each essay will be sent in a sealed envelope to the Secretary on or before October 15, 1897.

4. The essay will be signed *only* with the *nom de plume* adopted by the author. A sealed envelope bearing the *nom de plume* on the outside, and enclosing full name and address, must accompany the essay. This envelope will be opened in the presence of the Council after the decision of the Board of Award has been made.

5. The successful essay shall become the unconditional property of the Cavalry Association, and will be published in the CAVALRY JOURNAL.

6. The second essay shall receive honorable mention, and if desired by the Council, shall, upon payment of $25.00 to the writer, become the unconditional property of the Cavalry Association.

7. The prize shall be awarded upon the recommendation of a Board, consisting of three suitable persons chosen by the Executive

Council, who shall be requested to designate *the essay deemed worthy of the prize*, and also *the essay deemed worthy of honorable mention.*

Should members of the Board determine that no essay is worthy of the prize, they may designate one deemed worthy of honorable mention. Should the Board deem proper, it may recommend neither prize nor honorable mention.

The recommendations of individual members of the Board will be considered by the Council as strictly confidential.

In determining the essay worthy of the prize the Board will consider. *first*, historical accuracy; *second*, professional excellence; *third*, literary merit.

II.

The subject selected by the Council for the first essay of the series is as follows: "The History of the Cavalry of the Army of the Potomac, Including that of the Army of Virginia (Pope's), and also the History of the Operations of the Federal Cavalry in West Virginia During the War."*

III.

The names of the Board of Award will be announced in the September issue of the JOURNAL.

E. L. PHILLIPS,
Second Lieutenant Sixth Cavalry,
Secretary.

*NOTE.—The subject is intended to include organization, armament, equipment and supply, as well as the operations of the cavalry.